

# BLUE BOOK

A DIGEST OF THE METAL WORKING INDUSTRY

MAY, 1948

THIS MONTH

Crosley Motor's New Cobra Engine

Integration Method for Measuring

Wear

Compressors—Their Production and

Application

Social Security Benefits

Effect of Tax Policy on Machine

Industry

What's New in Metalworking

Available Literature

Advertisers' Products Index

Index to Advertisers

COMPLETE INDEX ON PAGE 5

A HITCHCOCK PUBLICATION

# MARVEL Saws Speed-Up Deliveries



Steel warehouses and stockrooms deliver cut-off lengths in any quantity **FASTER—BETTER—CHEAPER** when equipped with MARVEL 6A and 9A Automatic Hack Saws. Far faster, floor to floor, than any other hack saws, they save valuable machine hours by reducing cutting-off time to a fraction—save other machining hours by producing accurately cut pieces of exact length.

There is a MARVEL Saw for every need—in every capacity range and price class. Your local MARVEL Sawing Engineer will gladly study your metal sawing problems and requirements and make recommendations as to methods and equipment.

## TUBE DISTRIBUTORS CO., INC.

Representatives  
Chicago Office  
Armstrong-Blum Mfg. Co.  
Chicago 39, Illinois

Office and Warehouse 225 Green Street, Brooklyn 23, N.Y. Phone CHRYSTAL 8-4000

May 6, 1947

Gentlemen:

In a short time we expect to place an order with you for another No. 9A Marvel Automatic Hack Saw. This is in addition to the two machines we now have.

Our present Marvel Automatic Hack Saws are giving us very satisfactory service, enabling us to speed cutting of mechanical and boiler tubes to our customers' required lengths at a minimum of cost, both for labor and blades.

Your service and attention to our requirements have been very satisfactory.

Sincerely,

TUBE DISTRIBUTORS CO., INC.

*A. J. Lewis*

Superintendent

AFL:CB



# MARVEL SAWS

*Metal Cutting*

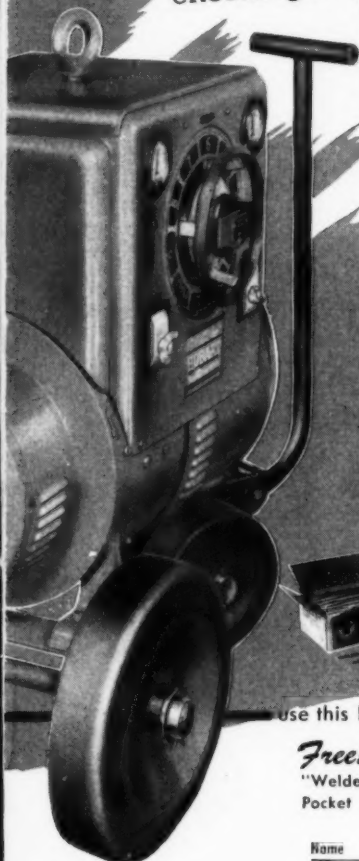
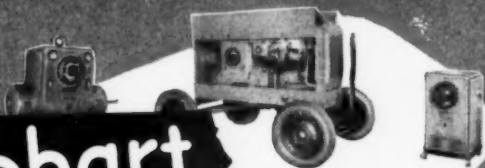
Better Machines—Better Blades





# hobart

simplified control  
encourages **faster, better arc welding**



It's so simple, so easy to obtain superior quality welds and increase welding speed when Hobart Arc Welders are at work. By turning just two dials, the operator selects the exact welding heat from 1000 possible combinations of voltage and amperage. Then by removing the Remote Control Dial, he is able to adjust welding heat at the work—eliminating the countless steps in returning to the machine. These are only two of the many time- and money-saving features found in Hobart Welders that make them the biggest profit producers on the post-war market! Check and mail the coupon today for complete information.

Hobart Welding Rods are available in every type for welding today's most modern metals and alloys. Send coupon for free booklet.



**Hobart BROTHERS COMPANY**

Box TB-58 Troy, Ohio. "One of

the World's Largest Builders of Arc Welders"

use this handy coupon

**Free!** Handy  
"Welders' Vest  
Pocket Guide."

Gentlemen: Please send me free book and new Hobart catalog showing the entire welder line—without obligation.

Hobart Brothers Co., Box TB-58 Troy, Ohio

Name

Address

City

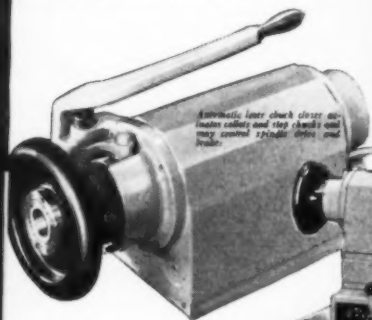
State

# RIVETT

## WHEN COSTS AND QUALITY COUNT THE *New* 918-S TURRET LATHE

If you machine small and medium sized parts from bar stock or on second operations — look to this new Rivett Turret Lathe. It is designed to buy its way into your plant with cost savings and quality control.

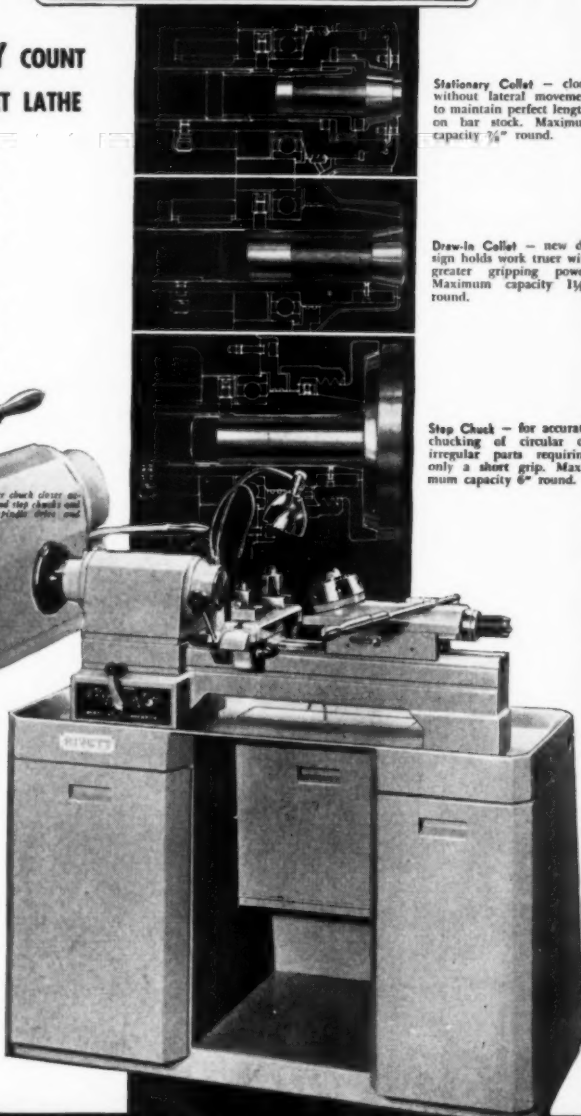
The 918S Turret Lathe cuts the initial cost of investment by taking work from larger machines. It follows by reducing the "dead time" of set-up and spoilage on



every job. Then it really pays with lowered time on every piece. How? — With the right spindle speed for efficient tooling, with quick means for chucking work, with properly grouped control levers and by reducing operator fatigue.

Features designed into the 918S Turret Lathe to guard quality include a rigidly mounted precision ball bearing spindle, precise tool indexing, hardened and ground steel bedways, vibration-free drive and mounting.

Write for Bulletin 918-ST



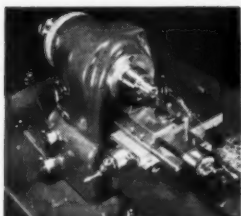
**Stationary Collet** — closes without lateral movement to maintain perfect lengths on bar stock. Maximum capacity  $\frac{3}{4}$ " round.

**Draw-In Collet** — new design holds work truer with greater gripping power. Maximum capacity  $1\frac{1}{4}$ " round.

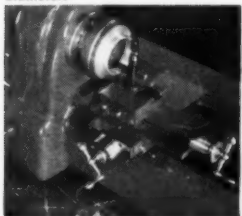
**Stop Chuck** — for accurate chucking of circular or irregular parts requiring only a short grip. Maximum capacity 6" round.

### RIVETT LATHE & GRINDER, Inc.

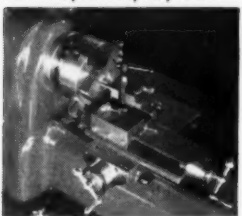
BRIGHTON • BOSTON • MASS. • U. S. A.



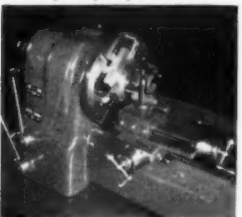
**Collet Work** — The right machine for collet work of one-inch or less diameter.



**Step Chuck Work** — For rapid and accurate holding of tubing, castings, moldings, stampings and machined parts. Capacity to 6".



**Jaw Chuck Work**—Integral mount, universal or independent, for extra accuracy. Capacity to 5".



**Face Plate Work** — 9" slotted and tapped face plate for holding irregular shapes.

**HARDINGE**  
ELMIRA, N.Y.

## HIGH SPEED PRECISION LATHE

**Correct Size - High Speed - Precision Results**



**HARDINGE**

DOVETAIL BED

HARDENED  
AND  
GROUND STEEL

### SPECIFICATIONS:

1" Collet Capacity  
9" Swing  
17" Center Distance  
8 Speeds to 4000 r.p.m.

The above three important requirements for proper lathe work in tool rooms, production departments, or laboratories are completely fulfilled by the new Hardinge DV59 High Speed Precision Lathe.

Correct size of the machine in relation to work saves loss from under-capacity production on larger lathes. High spindle speeds, up to 4000 r.p.m., permit full capacity cutting and excellent finish. Sustained accuracy and ease of operation assure precision results.

Send for Free illustrated Bulletin DV 59



**HARDINGE BROTHERS, INC., Elmira, N. Y.**

Offices in principal cities. Export office, 269 LaFayette St., New York 12, N. Y.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

# ARMSTRONG



## ARMSTRONG TOOL HOLDERS give the lowest possible tool cost

The more operations you tool with ARMSTRONG TOOL HOLDERS, the greater your savings and profits. These permanent multi-purpose tools are low in initial cost. They give years of continuous service, reducing the direct tool cost per job to a matter of cents. Using small cutters or bits quickly ground from stock shapes, they "Save: All Forging, 70% Grinding and 90% High Speed Steel."

But greater still than these substantial direct savings are the indirect savings these tools effect. They reduce "tooling-up" to a matter of minutes—end costly delays and keep men and machines producing. Strong and efficient, they permit higher speeds and heavy feeds—machine more pieces per machine hour, machine more accurately, reducing losses through rejects or spoilage.

Use ARMSTRONG TOOL HOLDERS for every operation on lathes, planers, slotters and shapers, on turret lathes and screw machines, to cut costs and increase profits.

Write for Bulletins on—

- (a) ARMSTRONG Carbide Tool Holders and ARMIDE Carbide Cutters
- (b) ARMSTRONG CA tool Holders and ARMALOY Cast Alloy Cutters

**ARMSTRONG TOOLS ARE STOCKED BY INDUSTRIAL DISTRIBUTORS**

**WRITE FOR CATALOG**

## ARMSTRONG BROS. TOOL CO.

*"The Tool Holder People"*

5208 W. Armstrong Ave.

Chicago 30, U.S.A.

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Pacific Coast Whse. & Sales Office: 1275 Mission St., San Francisco 3, Calif.



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# Keep the CENTER

"as COOL as  
a cucumber"



with

## Anti-Scoring LUBRICANT

Actual tests prove that CMD Anti-Scoring Lubricant will not break and cause scoring or metal-to-metal contact—even under pressures exceeding 50,000 pounds per square inch. Reduce operating costs—eliminate unnecessary waste and danger—give your tools and equipment the best anti-scoring protection available—CMD Center Point lubricants. Write for FREE SAMPLE kit and catalog!



### CMD Helical Groove LATHE CENTER

(shown above)

gives top performance—under severest shop conditions. The groove carries oil right to the point. Center lasts longer—work stays cooler.

## MAIL COUPON NOW!

**CHICAGO MANUFACTURING & DISTRIBUTING CO.**  
Dept. 5BB, 1928 West 46th St., Chicago 9, Ill.

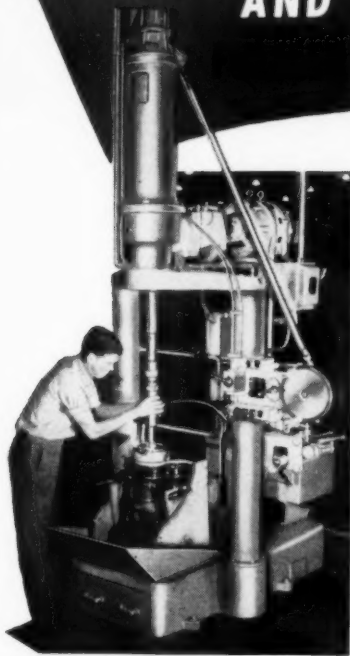
Without obligation please send us a free sample kit of one tube of CMD Center Point Lube and one tube of CMD Center Point Oil. Also, send Catalog describing CMD Helical Groove Centers.

NAME.....

FIRM NAME.....

ADDRESS.....

# WANT TO SPEED PRODUCTION of Precision Finished Bores AND REDUCE COSTS?



Fulmer Model 10-25 machine honing 5 3/4" bore aircraft cylinder, removing .006" of stock at rate of 24 cylinders per hour. (Photo courtesy U.S. Marine Corps.)

All classes of internal bores, 1/2" to 30" diameter, can be precision finished faster and more economically by honing on Fulmer Honing Machines *than by any other* method. Working tolerances as close as  $\pm .0001$ " can be held on bore size, straightness, roundness. Any surface finish from 1 to 20 microinches rms can be automatically produced.

Stock is removed fast. It is common practice for stocks of .015"—.060" to be removed in a fraction of the time required to set up the job for boring. Any conventional honing head can be used.

Fulmer Honing Machines are known for fast stock removal, ease of control and operation, rugged construction, and adaptability for a wide range of work. Engineered to give you maximum production with minimum investment, Fulmer Honing Machines offer the greatest value in the honing field. Investigate their advantages for your production. Write now for bulletins.

## FULMER

**C. ALLEN FULMER COMPANY**

1242 First National Bank Bldg., Cincinnati, Ohio

**PRECISION PRODUCTION EQUIPMENT**

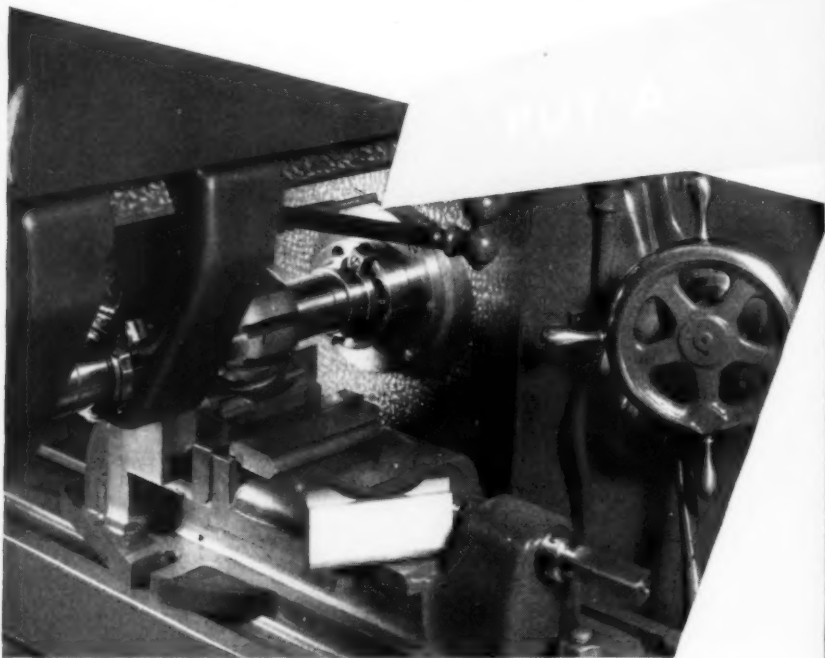
★ Honing Machines • Rod Borsers • Piston Ring Lappers

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

● It's a tough job to put the squeeze on costs when you're manufacturing small quantities. But it can be done. If your shop handles milling, drilling or shaping operations, Cincinnati Vises will help you out in two ways:

1. All Cincinnati Vises . . . Plain, Swivel, Toolmaker's, and All Steel . . . are exceptionally rugged. They hold the part tightly, enabling the operator to take a heavy cut. For proof, look at the illustration below.
2. It's easy to make special jaws to hold odd-shaped parts, or those requiring accurate location. You can do this yourself, at a fraction of the cost of special fittings. Complete dimensions will be found in the literature.

Perhaps many parts in your shop—especially those made in small to medium size quantities—could be milled, shaped, or drilled at a lower cost with Cincinnati Vises. Four types are available, illustrated on the opposite page. Complete data may be obtained by writing for literature listed for each type.



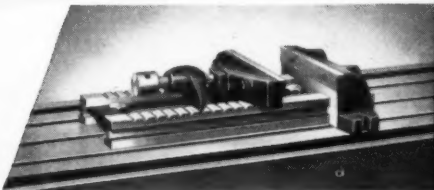
Taking a heavy cut,  $11/32$ " deep x  $2\frac{1}{8}$ " wide, in one pass. The parts are held in a Cincinnati No. 3 Plain Vise equipped with jaws made especially for the job.



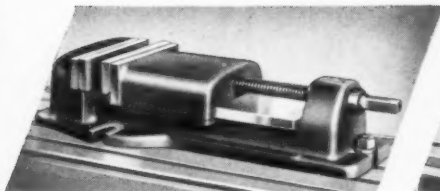


**TOOLMAKER'S UNIVERSAL VISE** . . . for general toolroom work. Can be swiveled up to 90° in a vertical plane—360° in a horizontal plane. Publication No. M-988.

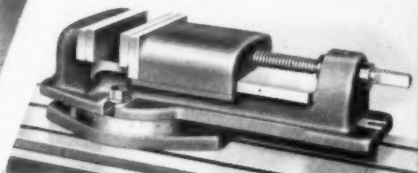
## ...WITH CINCINNATI VISES



**ALL STEEL VISE.** Slight swivel in movable jaw adapts jaw to irregularities of rough castings. Notched support bars provide quick adjustment of movable jaw. Publication No. M-1247.



**PLAIN VISE.** Available in Nos. 3 and 5 sizes. Depth, width, and opening of jaws: No. 3—1 1/8" x 6 1/8" x 4". No. 5—2 1/2" x 8 3/8" x 7". Publication No. M-1013-1.



**SWIVEL VISE.** Available in Nos. 3 and 5 sizes. Specifications same as Plain Vises. Swivel base can be removed, converting the unit into a Plain Vise. Publication No. M-1013-1.

**CINCINNATI 9, OHIO, U. S. A.**

**MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES**

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*Get the facts on...*

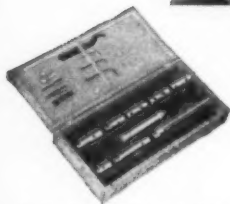
THE **Adjusto**

THE SINGLE  
**BORING BAR**  
for all your boring

For use on any Boring, Milling, Turret, or Automatic Screw Machine, and designed for practically all boring in manufacturing operations.



For the first time, rigidity in an adjustable bar is assured by ADJUSTO's special-design dovetailed section in the head. This section, operated by #40 ground and hardened screw, slides on ground and polished surfaces thus eliminating inaccuracies caused by wear.



- 1 MICROMETER ADJUSTMENT....accurate to .0001"
- 2 ANY LENGTH BORE.....up to 21"
- 3 ANY DIAMETER BORE.....up to 16"
- 4 USES STANDARD SQUARE TOOL BITS

*Your inquiries welcome—Send for full particulars*

Each Adjusto set is packaged in convenient plywood container designed for ease in handling and safe storage.

**J-W. SALES CO., INC.**  
822 FRICK BUILDING  
PITTSBURGH 19, PA.

# Contouring IRREGULAR Shapes



1. by AUTOMATIC DUPLICATION

Cincinnati Shapers contour irregular shapes—economically—whether in the tool room or in the manufacturing plant.

- 1 Where production is desired, costs reduced by accurate automatic duplication.
- 2 A unit or small lot is economically produced by manual control.

Accurate, sensitive, vertical and front controlled cross feeds and the overall accuracy of a Cincinnati Shaper enable the operator to work to very close limits.

Write for information on contouring irregular shapes on a Cincinnati Shaper—the handy man of tool rooms and shops.



2. by MANUAL CONTROL



## THE CINCINNATI SHAPER CO.

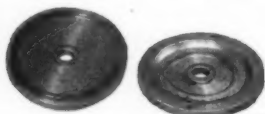
CINCINNATI 25, OHIO U.S.A.  
SHAPERS • SHEARS • BRAKES

# Underwood tackles HIGH BREAK-EVEN POINT

The Underwood Corporation of Hartford, Conn., is completing a far-sighted program to eliminate production inefficiencies in the manufacture of their world famous typewriters and business machines. Obsolete equipment is being replaced by fully automatic machine tools.

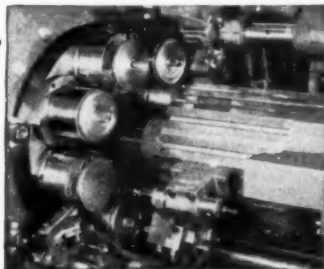


## ON THIS PART



This type bar segment was formerly machined by 6 operators on 4 turret lathes, 2 engines and 1 special grooving machine. These 7 machines and 6 operators were replaced by 1 New Britain Model 88 Automatic Chucking Machine.

\*\*\*\*\*  
\* RESULT



## ARE YOU MISSING THE BOAT

You can't afford to overlook the possibilities of lowering your break-even point in a similar manner. The parts you are now producing in your plant may well be produced cheaper and better on a New Britain Automatic.

The parts described in our new *Cost History* file were money-losers until New Britain engineering turned them into money-makers. Let us send you your free copy.

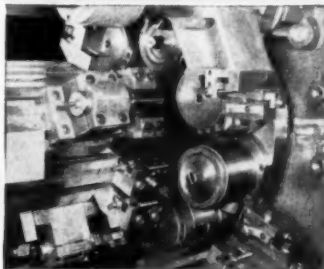
**NEW BRITAIN AUTOMATICS**  
**COST LESS PER FINISHED PIECE**



# NEW BRITAIN



THE NEW BRITAIN MACHINE COMPANY  
NEW BRITAIN-GRIDLEY MACHINE DIVISION  
NEW BRITAIN, CONNECTICUT  
448H02



The operations are finishing the O.D., facing both contoured sides, machining the I.D. of the hub, and trepanning wire grooves in one face. Simultaneous completion of both sides was made possible by arranging the machine for double index.



**\$195**  
84 BLOCKS  $\pm .000008"$

## Precision within reach of everyone

When gage blocks are readily available, guess work in the range below .001" is minimized. Production difficulties are avoided and costs are reduced.

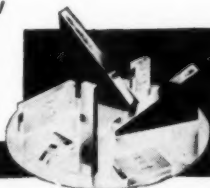
Place Webber Gage Blocks within easy reach, two or more sets if necessary, with instructions to use them instantly whenever doubt arises.

*The cost is now lower than ever before*

**WEBBER GAGE CO., 12905 Triskett Rd., Cleveland 11, Ohio**

### WEBBER MAKES PRECISION GAGE BLOCKS EXCLUSIVELY

- ★ Gage Block Sets in Steps of .00005"
- ★ Individual Special Size Blocks.
- ★ Heavy Duty Gage Blocks.
- ★ Angle Gage Blocks in Steps of one second.
- ★ Carbolux (Carbide) Wear Gages.



**Webber**  
**PRECISION  
GAGE BLOCKS**



## *Easy-to-Handle* **TUMICO SNAP GAGE** *Quickly Measures 15"* *Ground Shoulder Diameter*

**Light Tubular Steel Frame Permits "Feather Touch" Feel for Accurate Gaging of Forged Gear Hub O.D. During Grinding Operation.**

Through the use of this Tumico Snap Gage, overall measuring time is sharply reduced. Gaging the ground shoulder O. D. is as simple as shown in the illustration. Machine operator merely "feels" for  $\pm .001$  dimension and is assisted by light tubular frame structure which is 25 to 30% lighter than solid frame snap gages.

These precision instruments will cut your measuring time and improve work quality. Take advantage of Tumico standard snap gages from 5 1/2" to 24" or special sizes to suit requirements.

### **MORE TIME SAVING—PROFIT PRODUCING TUMICO PRODUCTS FOR YOUR NEEDS.**



**1. Tumico Caliper and Wire Gage** is a combination measuring instrument. It will measure sheets and plates from 0" to 4". Wire gage slots are U. S. Standard No. 1 through No. 30. Markings are deep etched for rapid reading.



**2. Tumico Tubular Micrometers** feature "feather-touch" feel for making repetitive precision measurements. They are available in the

Series T fixed anvil type in size 0" to 30" and in Series M mandrel type in sizes from 0" to 96" both in sets or combination. Embodied in these micrometers are such important structural features as hardened and ground spindles, ground and lapped spindle threads, special alloy steel vacuum sealed frames, triple plated with copper, nickel and chrome and easy to read numerals.



**3. Tumico Vernier Height Gages** quickly measure and scribe off vertical distances from a plane surface.

Beam and vernier are scientifically calibrated and deep

etched for clear, easy reading. This gage is indispensable in the tool shop when precision measurements must be maintained.



**4. Tumico Thrift Micrometers** are economically priced units having drop forge steel frames, hardened anvils and spindle tips. They are available with ratchet stop and lock ring, or Vernier scale in size 0" to 6".

*Write Today*

—for further information about Tumico Precision Measuring Instruments for all standard and special requirements.

**TRADE  
TUMICO  
MARK**

**TUBULAR MICROMETER CO.**  
MILWAUKEE BRANCH  
ST. JAMES, MINNESOTA, U.S.A. PLANKINTON BLDG.

# Report No. 7

## TANTUNG®

**NO NEW EQUIPMENT COST NECESSARY HERE!**

**It's practical results that count  
on every Tantung application**

### Tantung and S. A. E. 1144 Steel Forging

Machine:	New Britain Automatic
Part:	S. A. E. 1144 Steel Crank Shaft Forging
Speed:	120 S.F.M.
Depth of Cut:	1/8 inch
Production:	120 PIECES PER HOUR Previous Practice, 35
Pieces Per Grind:	750

### REPORT:

Previous practice using H.S.S. at only 67 S.F.M. resulted in a maximum of 35 pieces per hour. Manufacturers contemplated purchasing new machines in an effort to increase production, BUT—on testing a complete Tantung tool set-up new equipment was cancelled.

### SUGGESTION:

Try Tantung today on your troublesome and costly production problems. Remember! Tantung, the tough, shock resistant, non-ferrous cast alloy performs at far higher feeds and speeds on your present equipment than high speed steels.

Write or call your nearest V-R Field Engineer for courteous, experienced help on your tough production problems. Remember, there is always an effective and economical solution **TO ANY TOOLING PROBLEM** with V-R carbide or Tantung tools.



Send for your free copy of the V-R 400 Carbide Tool and Blank Catalog, 32 pages of important carbide engineering information.



# VASCOLOY-RAMET

## CORPORATION

NORTH CHICAGO  
ILLINOIS

District Sales and Service in Principal Cities

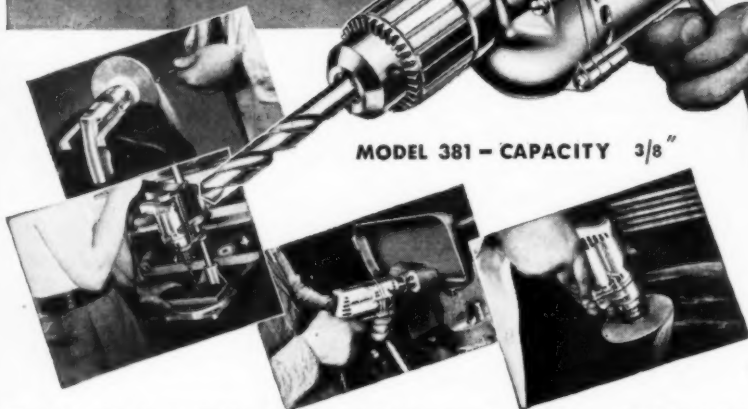
An affiliate of The Fosterite Metallurgical Corporation and The Vanadium Alloys Steel Company

**THE DRILL ...**  
*for*  
**Every Job!**

**THE** *Mall Drill*  
REG. U.S. PAT. OFF.



MODEL 381 - CAPACITY  $\frac{3}{8}$ "



Here is a handy portable electric tool that not only provides a drill for all materials—wood, brick, masonry, steel and plastics—but can also be readily adapted for grinding, sanding, wire brushing, buffing and polishing. When held in a vise and equipped with a grinding wheel, it is excellent for sharpening tools; when fitted into a special stand, it converts into a drill press. Other models available with  $\frac{1}{4}$ " to  $1\frac{1}{4}$ " capacities.

Ask your Supplier or write Power Tool Division for literature.

**MALL TOOL COMPANY**

**7742 South Chicago Avenue**

**Chicago 19, Illinois**

**26 Years of "Better Tools For Better Work"**







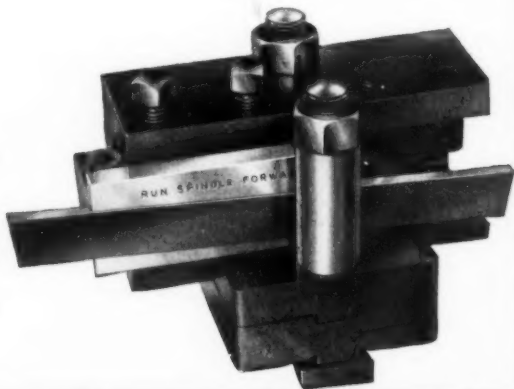
## NEW R and L *Cutting-Off* Tool Holder

Designed for use in the new R and L Tool Post shown below, R and L Cutting Off Tool Holders are built in three sizes to fit Brown and Sharpe Automatics—No. 00 or No. 00G, No. 0 or No. 0G, No. 2 or No. 2G. Can be used with spindle running either forward or backward.

Uses blades of special alloy high speed steel. Solid Tungsten Carbide blades can also be furnished. Write for complete details of this and other new R and L Tools — designed for greater production capacity.

## NEW! R and L TOOL POST

Hold square or flat tools on front or rear cross-slide.



# R AND L TOOLS

1825 BRISTOL ST., NICETOWN, PHILADELPHIA 40, PA.



## IT TAKES SOMETHING EXTRA TO BE A *Specialist!*

You've got to be good to stay in the big league. But you've got to have something "extra" to be a standout! Just as it takes extra training to slide safe into home plate, so, years of experience have made BATH ground thread taps a *standout* for quality, wear and precision machining!

Toughened by hardening and tempering—then ground from the solid—BATH taps are your guarantee of efficient production and "extra" quality. See your BATH representative or write direct about your tap problems.

(Transportation is paid to your plant on all Bath products!)

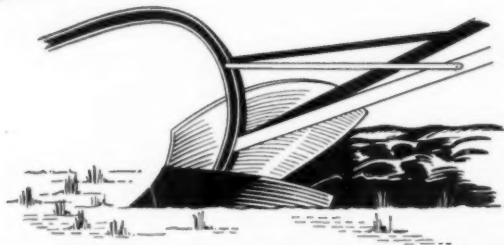
# JOHN BATH CO.

INCORPORATED

14 Grafton Street  
WORCESTER 8, MASS.

GROUND THREAD TAPS • PLUG AND RING THREAD • INTERNAL MICROMETERS

# A tap is like a plow..



## ... IT'S ALMOST IMPOSSIBLE TO LUBRICATE



**THAT'S WHY  
DETROIT  
TAPS ARE MADE  
OF M-11  
CHROME-COBALT  
H. S. S.**

*The Home of*  
"M-11"  
CHROME-COBALT  
H. S. S. TAPS, THREAD  
MILLING CUTTERS &  
THREAD GAGES

The cutting edges and faces at the tip of the thread on a tap are "buried" in the metal on three sides. It's almost impossible to get lubricant to those points. Furthermore, cutting is continuous.

That makes thread cutting one of the toughest jobs there is in metal cutting, and is a major reason why Detroit taps are made of that toughest of tap steels—M-11 chrome-cobalt H. S. S.

The cobalt gives Detroit taps greater uniformity and higher red hardness.

Chromium gives Detroit taps greater toughness, for less breakage; deeper hardness penetration, corrosion resistance and GREATER RESISTANCE TO ABRASION.

And back of every M-11 tap, thread milling cutter and thread gage is a service record which can make the proud claim:

**WE'VE NEVER "SHUT DOWN" A LINE YET!!**

**DETROIT**  
TAP & TOOL CO.  
8432 BUTLER STREET • DETROIT 11, U. S. A.

# A NEW COOLANT -



**HIGHER  
SPEEDS**



**HEAVIER  
CUTS**



**LONGER  
TOOL  
LIFE**

Ahcower C G applies a new principle to water emulsions for reducing heat and friction in metal and plastic operations. A product of New England's oldest industrial chemical company. Tested and proven in some of America's largest industrial plants.

SEND FOR INFORMATION

**ARNOLD, HOFFMAN & CO., Inc.**

*Machine Tool Division*

**55 Canal Street, Providence 1, R. I.**

*Please send me information about Ahcower C G*

Name

Firm

Address

City and State

# *They're all using* **SHEAR SPEEDS\***

\*TRADE  
MARK

## **AUTOMOTIVE**

Matches output of 8 double thread hobs plus less shaving time.

## **MISCELLANEOUS GEARS**

One Shear-Speed\* produces all these stoker drive parts.

## *and now for* **BIG GEARS**

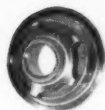
The new Shear-Speed\* 18103, for gears, clutches, and other external shapes up to 10 inch O. D. and 2 3/4 in. thick.

*If you have not yet investigated how the Shear-Speed\* can cut your output of gears, clutches and other external shapes, write today for Bulletin #1800-47.*



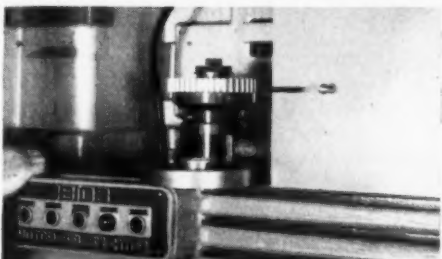
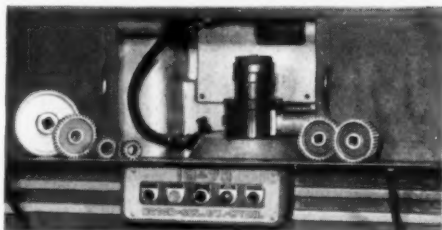
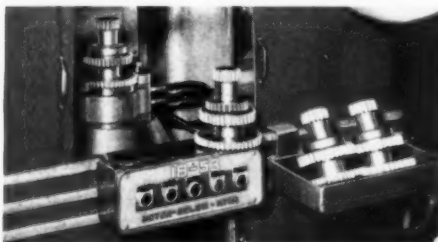
## **WRINGERS**

Better gear design.  
Cutting time 30 secs.



## **BICYCLE CLUTCHES**

Eccentric shapes.  
Cutting time 14 secs.



## **MICHIGAN TOOL COMPANY**

7171 E. McNichols Road

DETROIT 12, U. S. A.

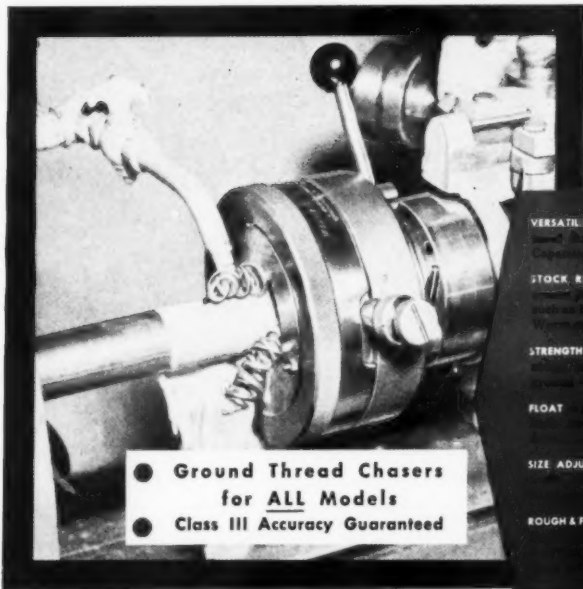
Jones & Lamson

# Ground Thread Chasers

for 25 years!

## FIRST and FINEST...

All models of Jones & Lamson RADIAL TYPE Automatic Opening Threading Dies are equipped with GROUND THREAD CHASERS. They are the ideal investment for general threading work involving relatively small lots and diversified pitches. They will lower your tooling inventory too, because standard chaser sets are immediately available from factory stock.



## RADIAL DIE HEADS

- Ground Thread Chasers for ALL Models
- Class III Accuracy Guaranteed

**VERSATILITY** - Will cut right or left hand threads, coarse or fine pitch. Capabilities from No. 6 to 45°.

**STOCK REMOVAL** - Suitable for most jobs. Heavy duty threading action. Modified Square, 30° Acme, Worm or other threads.

**STRENGTH** - Every part is of solid steel, hardened and precision ground - no built-up sections.

**FLOAT** - All models are built with the accuracy and long-life of the J & L design.

**SIZE ADJUSTMENT** -

**ROUGH & FINISH LEVER**

# Jones & Lamson



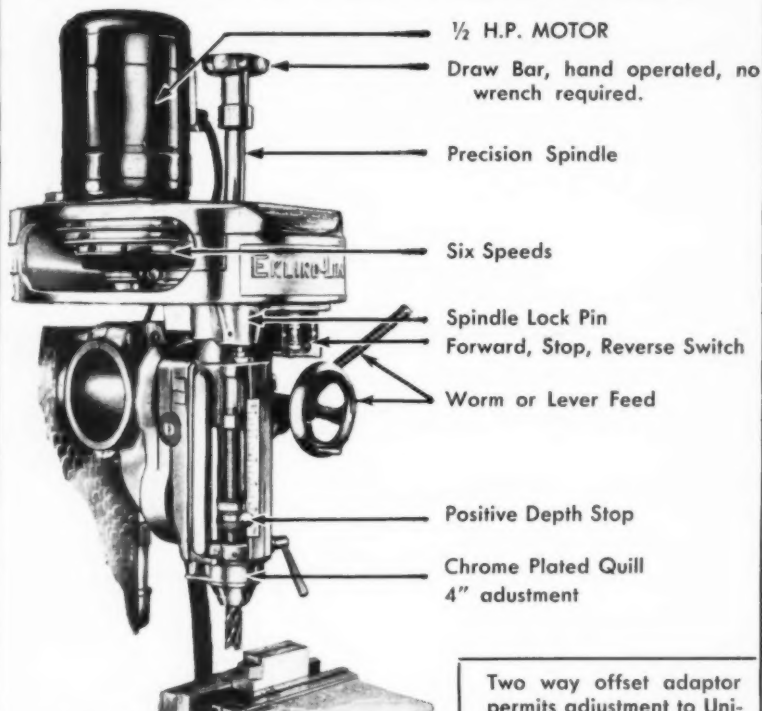
**JONES & LAMSON MACHINE COMPANY**  
Springfield, Vermont, U. S. A.

Manufacturers of: Universal Turret Lathes • Key Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

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# EKLIND UNIVERSAL HIGH SPEED MILLING HEAD

*For Precision Milling, Drilling and Boring*



**Quoted Direct or Through Your Dealer**

**Some Dealer Territories Available**

Two way offset adaptor permits adjustment to Universal angles.

Capacity  $\frac{1}{2}$ " straight Shank Cutters.

**UNIVERSAL HIGH SPEED TOOL CO.  
549 W. Washington Blvd., Chicago 6, Ill.**



# 3 SIMPLE STEPS TO *Better* SQUARE HOLES

## BORING BARS, CUTTER HEADS, TOOL HOLDER

*with* STURDY SQUARE HOLED SLEEVES



**1** Drill and ream the hole in the part to size. Sturdy Square Holed Sleeves are furnished to the size shown in the specification table or they may be ordered with .015" grinding stock so that you can grind your Sleeve to fit.



**2** Sweat or press Sleeve into place. If the Sleeve is longer than the diameter of the bar, the Sleeve should be set flush with the OD of the bar at the threaded end and the excess at other end ground off.



**3** Drill and tap for set-screw. This set-screw is not furnished with the Sturdy Square Holed Sleeve although the back-up screw is furnished.

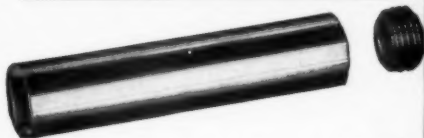
BUSHINGS MADE IN FOLLOWING SIZES:

$\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $1"$ .

# STURDY BROACHING SERVICE

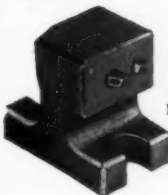
23514 Telegraph Rd. Detroit 19, Mich.

OVER 30,000 IN USE



One of the most difficult problems in tool making can be solved easily and quickly with Sturdy Square Holed Sleeves. The perfection of broached square holes can be had in boring bars, milling cutters and many other applications at a small fraction of the cost of imperfect hand-made square holes. The Sturdy Square Holed Sleeve consists of a round sleeve with a perfectly square hole broached through the center. This hole is tapped at one end to receive a back-up screw which is furnished with the Sleeve. The Sleeve can be sweated or pressed into a drilled and reamed hole to make a perfectly square accurate hole in a very few minutes.

The Sturdy Square Holed Sleeve will save you many hours and many dollars in the making of boring bars, milling cutters and other tools requiring square holes.



Patents Pending



A tool holder made with Sturdy Square Holed Sleeves. Tool holders of all types can be made more quickly and at lower cost this way.

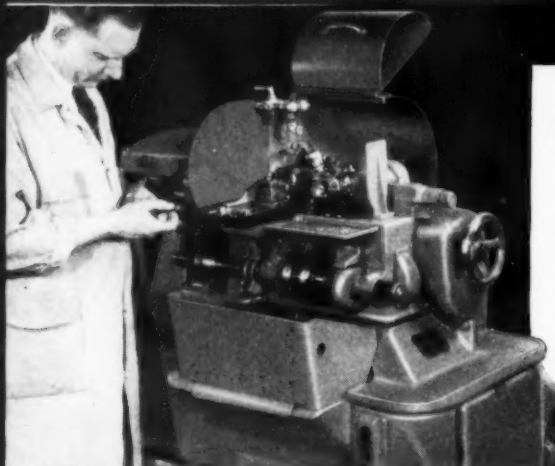
This milling cutter is made from a simple blank turned to size on a lathe with Sturdy Square Holed Sleeves sweated in to hold standard tool bits.

• SOME TERRITORIES STILL OPEN TO JOBBERS

Write for Literature

# AUTOMATICS

106 two-speed combinations of spindle speeds . . . positive chain drive to spindle



## No. 00G

Takes stock to  $\frac{3}{8}$ " diameter.  
Turning capacity to  $\frac{3}{4}$ ".

$\frac{1}{2}$ " capacity feed tube for light to medium work and turning capacity to  $1\frac{1}{4}$ " can be furnished.

## No. OG

Takes stock to  $\frac{5}{8}$ " diameter.  
Turning capacity to  $1\frac{1}{4}$ ".

$\frac{3}{4}$ " capacity feed tube for light to medium work and turning capacity to 2" can be furnished.

**I**MPROVEMENTS AND REFINEMENTS in these Automatic Screw and Automatic Cutting-Off Machines increase their efficiency and permit maintenance of closer limits, finer finish and more uniform production. Wide selec-

tion of speed ratios makes possible the use of correct speeds for threading without limiting selection of efficient high speeds for forming, drilling and similar operations. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

# BROWN &

BROWN & SHARPE												
OOG AUTO. SCREW MACHINE						SPINDLE SPEEDS						
SPINDLE SPEED RPM	FEEDS			FEEDS			FEEDS			FEEDS		
	1.0	1.5	2.0	1.0	1.5	2.0	1.0	1.5	2.0	1.0	1.5	2.0
6050	0.001	0.0015	0.002	0.001	0.0015	0.002	0.001	0.0015	0.002	0.001	0.0015	0.002
5000	0.0012	0.0018	0.0024	0.0012	0.0018	0.0024	0.0012	0.0018	0.0024	0.0012	0.0018	0.0024
4000	0.0016	0.0024	0.0032	0.0016	0.0024	0.0032	0.0016	0.0024	0.0032	0.0016	0.0024	0.0032
3000	0.0024	0.0036	0.0048	0.0024	0.0036	0.0048	0.0024	0.0036	0.0048	0.0024	0.0036	0.0048
2000	0.0036	0.0054	0.0072	0.0036	0.0054	0.0072	0.0036	0.0054	0.0072	0.0036	0.0054	0.0072
1500	0.0048	0.0072	0.0096	0.0048	0.0072	0.0096	0.0048	0.0072	0.0096	0.0048	0.0072	0.0096
1000	0.0072	0.0108	0.0144	0.0072	0.0108	0.0144	0.0072	0.0108	0.0144	0.0072	0.0108	0.0144
750	0.0096	0.0144	0.0192	0.0096	0.0144	0.0192	0.0096	0.0144	0.0192	0.0096	0.0144	0.0192
600	0.012	0.018	0.024	0.012	0.018	0.024	0.012	0.018	0.024	0.012	0.018	0.024
500	0.0144	0.0216	0.0288	0.0144	0.0216	0.0288	0.0144	0.0216	0.0288	0.0144	0.0216	0.0288
400	0.0192	0.0288	0.0384	0.0192	0.0288	0.0384	0.0192	0.0288	0.0384	0.0192	0.0288	0.0384
300	0.0288	0.0432	0.0576	0.0288	0.0432	0.0576	0.0288	0.0432	0.0576	0.0288	0.0432	0.0576
250	0.036	0.054	0.072	0.036	0.054	0.072	0.036	0.054	0.072	0.036	0.054	0.072
200	0.048	0.072	0.096	0.048	0.072	0.096	0.048	0.072	0.096	0.048	0.072	0.096
150	0.072	0.108	0.144	0.072	0.108	0.144	0.072	0.108	0.144	0.072	0.108	0.144
100	0.108	0.162	0.216	0.108	0.162	0.216	0.108	0.162	0.216	0.108	0.162	0.216
75	0.144	0.216	0.288	0.144	0.216	0.288	0.144	0.216	0.288	0.144	0.216	0.288
60	0.18	0.27	0.36	0.18	0.27	0.36	0.18	0.27	0.36	0.18	0.27	0.36
50	0.216	0.324	0.432	0.216	0.324	0.432	0.216	0.324	0.432	0.216	0.324	0.432
40	0.288	0.432	0.576	0.288	0.432	0.576	0.288	0.432	0.576	0.288	0.432	0.576
30	0.384	0.576	0.768	0.384	0.576	0.768	0.384	0.576	0.768	0.384	0.576	0.768
25	0.48	0.72	0.96	0.48	0.72	0.96	0.48	0.72	0.96	0.48	0.72	0.96
20	0.6	0.9	1.2	0.6	0.9	1.2	0.6	0.9	1.2	0.6	0.9	1.2
15	0.8	1.2	1.6	0.8	1.2	1.6	0.8	1.2	1.6	0.8	1.2	1.6
10	1.2	1.8	2.4	1.2	1.8	2.4	1.2	1.8	2.4	1.2	1.8	2.4
7.5	1.6	2.4	3.2	1.6	2.4	3.2	1.6	2.4	3.2	1.6	2.4	3.2
6	2.0	3.0	4.0	2.0	3.0	4.0	2.0	3.0	4.0	2.0	3.0	4.0
5	2.4	3.6	4.8	2.4	3.6	4.8	2.4	3.6	4.8	2.4	3.6	4.8
4	3.0	4.5	6.0	3.0	4.5	6.0	3.0	4.5	6.0	3.0	4.5	6.0
3	3.6	5.4	7.2	3.6	5.4	7.2	3.6	5.4	7.2	3.6	5.4	7.2
2.5	4.5	6.75	9.0	4.5	6.75	9.0	4.5	6.75	9.0	4.5	6.75	9.0
2	6.0	9.0	12.0	6.0	9.0	12.0	6.0	9.0	12.0	6.0	9.0	12.0
1.5	8.0	12.0	16.0	8.0	12.0	16.0	8.0	12.0	16.0	8.0	12.0	16.0
1.25	10.0	15.0	20.0	10.0	15.0	20.0	10.0	15.0	20.0	10.0	15.0	20.0
1	12.0	18.0	24.0	12.0	18.0	24.0	12.0	18.0	24.0	12.0	18.0	24.0
0.75	16.0	24.0	32.0	16.0	24.0	32.0	16.0	24.0	32.0	16.0	24.0	32.0
0.6	20.0	30.0	40.0	20.0	30.0	40.0	20.0	30.0	40.0	20.0	30.0	40.0
0.5	24.0	36.0	48.0	24.0	36.0	48.0	24.0	36.0	48.0	24.0	36.0	48.0
0.4	30.0	45.0	60.0	30.0	45.0	60.0	30.0	45.0	60.0	30.0	45.0	60.0
0.3	36.0	54.0	72.0	36.0	54.0	72.0	36.0	54.0	72.0	36.0	54.0	72.0
0.25	45.0	67.5	90.0	45.0	67.5	90.0	45.0	67.5	90.0	45.0	67.5	90.0
0.2	54.0	81.0	108.0	54.0	81.0	108.0	54.0	81.0	108.0	54.0	81.0	108.0
0.15	66.0	99.0	132.0	66.0	99.0	132.0	66.0	99.0	132.0	66.0	99.0	132.0
0.125	80.0	120.0	160.0	80.0	120.0	160.0	80.0	120.0	160.0	80.0	120.0	160.0
0.1	96.0	144.0	192.0	96.0	144.0	192.0	96.0	144.0	192.0	96.0	144.0	192.0
0.075	120.0	180.0	240.0	120.0	180.0	240.0	120.0	180.0	240.0	120.0	180.0	240.0
0.06	144.0	216.0	288.0	144.0	216.0	288.0	144.0	216.0	288.0	144.0	216.0	288.0
0.05	180.0	270.0	360.0	180.0	270.0	360.0	180.0	270.0	360.0	180.0	270.0	360.0
0.04	216.0	324.0	432.0	216.0	324.0	432.0	216.0	324.0	432.0	216.0	324.0	432.0
0.03	288.0	432.0	576.0	288.0	432.0	576.0	288.0	432.0	576.0	288.0	432.0	576.0
0.025	360.0	540.0	720.0	360.0	540.0	720.0	360.0	540.0	720.0	360.0	540.0	720.0
0.02	432.0	648.0	864.0	432.0	648.0	864.0	432.0	648.0	864.0	432.0	648.0	864.0
0.015	540.0	810.0	1080.0	540.0	810.0	1080.0	540.0	810.0	1080.0	540.0	810.0	1080.0
0.0125	648.0	972.0	1296.0	648.0	972.0	1296.0	648.0	972.0	1296.0	648.0	972.0	1296.0
0.01	720.0	1080.0	1440.0	720.0	1080.0	1440.0	720.0	1080.0	1440.0	720.0	1080.0	1440.0
0.0075	864.0	1296.0	1728.0	864.0	1296.0	1728.0	864.0	1296.0	1728.0	864.0	1296.0	1728.0
0.006	1080.0	1620.0	2160.0	1080.0	1620.0	2160.0	1080.0	1620.0	2160.0	1080.0	1620.0	2160.0
0.005	1296.0	1944.0	2592.0	1296.0	1944.0	2592.0	1296.0	1944.0	2592.0	1296.0	1944.0	2592.0
0.004	1512.0	2268.0	3024.0	1512.0	2268.0	3024.0	1512.0	2268.0	3024.0	1512.0	2268.0	3024.0
0.003	1800.0	2700.0	3600.0	1800.0	2700.0	3600.0	1800.0	2700.0	3600.0	1800.0	2700.0	3600.0
0.0025	2160.0	3240.0	4320.0	2160.0	3240.0	4320.0	2160.0	3240.0	4320.0	2160.0	3240.0	4320.0
0.002	2592.0	3888.0	5184.0	2592.0	3888.0	5184.0	2592.0	3888.0	5184.0	2592.0	3888.0	5184.0
0.0015	3024.0	4536.0	6048.0	3024.0	4536.0	6048.0	3024.0	4536.0	6048.0	3024.0	4536.0	6048.0
0.00125	3600.0	5400.0	7200.0	3600.0	5400.0	7200.0	3600.0	5400.0	7200.0	3600.0	5400.0	7200.0
0.001	4320.0	6480.0	8640.0	4320.0	6480.0	8640.0	4320.0	6480.0	8640.0	4320.0	6480.0	8640.0
0.00075	5184.0	7776.0	10368.0	5184.0	7776.0	10368.0	5184.0	7776.0	10368.0	5184.0	7776.0	10368.0
0.0006	6048.0	9072.0	12096.0	6048.0	9072.0	12096.0	6048.0	9072.0	12096.0	6048.0	9072.0	12096.0
0.0005	7200.0	10800.0	14400.0	7200.0	10800.0	14400.0	7200.0	10800.0	14400.0	7200.0	10800.0	14400.0
0.0004	8640.0	12960.0	17280.0	8640.0	12960.0	17280.0	8640.0	12960.0	17280.0	8640.0	12960.0	17280.0
0.0003	10368.0	15552.0	20736.0	10368.0	15552.0	20736.0	10368.0	15552.0	20736.0	10368.0	15552.0	20736.0
0.00025	12096.0	18144.0	24192.0	12096.0	18144.0	24192.0	12096.0	18144.0	24192.0	12096.0	18144.0	24192.0
0.0002	14400.0	21600.0	28800.0	14400.0	21600.0	28800.0	14400.0	21600.0	28800.0	14400.0	21600.0	28800.0
0.00015	17280.0	25920.0	34560.0	17280.0	25920.0	34560.0	17280.0	25920.0	34560.0	17280.0	25920.0	34560.0
0.000125	20736.0	31104.0	41472.0	20736.0	31104.0	41472.0	20736.0	31104.0	41472.0	20736.0	31104.0	41472.0
0.0001	24192.0	36288.0	48384.0	24192.0	36288.0	48384.0	24192.0	36288.0	48384.0	24192.0	36288.0	48384.0
0.000075	28800.0	43200.0	57600.0	28800.0	43200.0	57600.0	28800.0	43200.0	57600.0	28800.0	43200.0	57600.0
0.00006	34560.0	51840.0	69120.0	34560.0	51840.0	69120.0	34560.0	51840.0	69120.0	34560.0	51840.0	69120.0
0.00005	41472.0	62208.0	82944.0	41472.0	62208.0	82944.0	41472.0	62208.0	82944.0	41472.0	62208.0	82944.0
0.00004	48384.0	72576.0	96768.0	48384.0	72576.0	96768.0	48384.0	72576.0	96768.0	48384.0	72576.0	96768.0
0.00003	57600.0	86400.0	115200.0	57600.0	86400.0	115200.0	57600.0	86400.0	115200.0	57600.0	86400.0	115200.0
0.000025	69120.0	103680.0	138240.0	69120.0	103680.0	138240.0	69120.0	103680.0	138240.0	69120.0	103680.0	138240.0
0.00002	82944.0	124416.0	165888.0	82944.0	124416.0	165888.0	82944.0	124416.0	165888.0	82944.0	124416.0	165888.0
0.000015	96768.0	145152.0	193536.0	96768.0	145152.0	193536.0	96768.0	145152.0	193536.0	96768.0	145152.0	193536.0
0.0000125	115200.0	172800.0	230400.0	115200.0	172800.0	230400.0	115200.0	172800.0	230400.0	115200.0	172800.0	230400.0
0.00001	138240.0	207360.0	276480.0	138240.0	207360.0	276480.0	138240.0	207360.0	276480.0	138240.0	207360.0	276480.0

# TEMPLET PINS *Increase Value* of CARTER *Micro-Precision GUIDE* *You Save Cost of Guide in 2 Weeks Sawing*



Carter Micro - Precision Guides  
with Templet Pins  
Carter Rigid Band Saw Wheels  
Carter Quick Change Tires

## CARTER PRODUCTS COMPANY

956 Michigan Trust Building  
Grand Rapids 2, Michigan

The addition of TEMPLET PINS to the Micro-Precision GUIDE enables your operator to saw more pieces per hour with increased accuracy, as costly and inaccurate marking of stock is eliminated. TEMPLET PINS permit sawing of normal band saw sweeps . . . You can save the cost of your CARTER GUIDE in from 10 days to 2 weeks sawing with the Templet Pin feature . . .

### WRITE TODAY!

You, like progressive Manufacturers across the continent, will be interested in the time and money saving features obtainable with CARTER Band Saw Equipment. We invite your requests for full details.

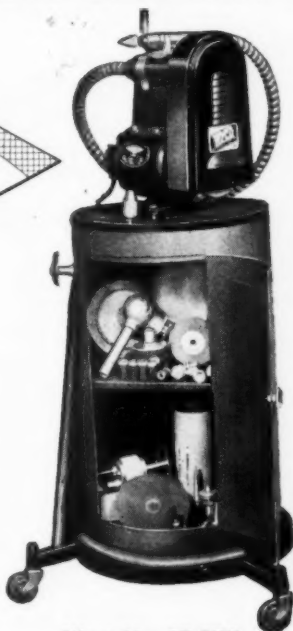
*Band Saw* WHEELS • TIRES • GUIDES • GUIDE LIGHTS

# COMPLETE REPAIR SHOP ALWAYS AT YOUR ELBOW!



## *The Repairmen's Special*

A Flexible Shaft Machine for maintenance or on-the-spot repair work; for sanding metal or wood, drilling, wire-brushing, grinding, buffing, for sawing metal or wood, filing, disc-sanding, carving, paint or varnish removal, waxing—scores of operations. Carries all tools conveniently in fully enclosed all steel, streamlined cabinet, mounted on easy rolling casters. Saves time! Saves labor! Quickly pays for itself!



Wyco No. 17-CKX

Handy-Matic  
complete only **\$198.75**

1/3 h. p. motor. Wayco Flexible  
Shaft 10-P, 5-ft. 3 speeds: 1400—  
2400—4500 RPM V Belt drive.  
Cabinet 32" high. Shipping weight  
135 pounds.

**25 Accessories, 2 dozen supplies (included in price)**

*Ask for descriptive bulletin and name of distributor nearest you.*

**WYZENBEEK & STAFF, Inc.** 841 W. HUBBARD ST.  
CHICAGO 22, ILLINOIS



210-TU



207-S



202

## Speed PRODUCTION WITH . . . DE-STA-CO *Quality* TOGGLE CLAMPS

Your work-holding tools give fast, uniform clamping action—longer life—greater power—because De-Sta-Co's more than forty models give you *quality* features.

- Well-engineered designs, precision-tooled for uniformity.
- Reamed bearing holes for accurate fit, sensitive operation.
- Fool-proof, *positive* toggle action—no cams.
- Friction-relieving off-sets in handles and links.
- Cold drawn solid bars—forged portable clamp parts.

New portable and plunger clamps are coming—to meet your various work-holding needs. Write for illustrated catalog and name of stocking representative in your area.

**DETROIT STAMPING COMPANY**  
347 MIDLAND AVE. • DETROIT 3, MICH.



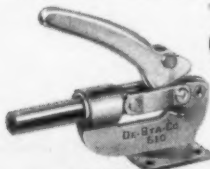
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110-C



464



610

# OLIVER Heavy Duty ACE Tool and Cutter Grinder



## THE LEADER IN TOOL ROOM EQUIPMENT

For over 30 years Oliver of Adrian has built outstanding equipment for tool rooms. The new Heavy Duty ACE is a splendid machine, designed for the express purpose of sharpening Tungsten-Carbide cutters and tools in their many forms.

THE HEAVY DUTY ACE has everything to make it the most economical, efficient tool and cutter grinder on the market. It is in use in hundreds of plants throughout the nation and is acclaimed by many as the best piece of equipment in use in their tool room.



Send for catalog

**OLIVER INSTRUMENT CO.**  
1408 E. MAUMEE ST.  
ADRIAN, MICHIGAN

IMPROVE YOUR TOOLROOM  
IT'S THE BACKBONE  
OF PRODUCTION

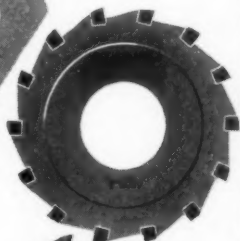


AUTOMATIC DRILL GRINDERS  
TOOL & CUTTER GRINDERS—DRILL  
POINT GRINDERS—TEMPLATE  
TOOL GRINDERS—FACE GRINDERS  
GRINDERS—DEWAXING MACHINES

CIRCLE R CIRCLE R CIRCLE R CIRCLE R

*Achievements in Precision!*

**CIRCLE R**  
TUNGSTEN CARBIDE TIPPED  
CIRCULAR SAWS



Like the Palomar mirror, Circle R Tungsten Carbide Tipped Circular Saws had to conform to the highest standards and were not offered until this goal was reached.

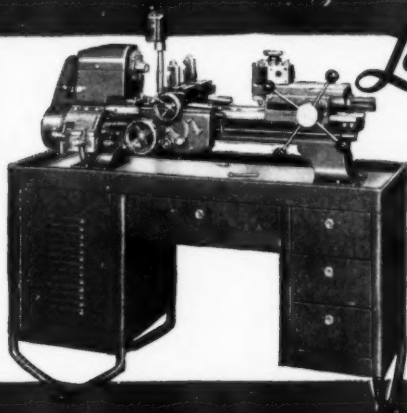
Circle R Tungsten Carbide Tipped Circular Saws will uphold the prestige that peerless workmanship and continuously fine performance has earned for the nationally known Circle R trade mark. Specifications:  $2\frac{1}{2}$ " to 10" in dia.  $2\frac{1}{2}$ " to 4" as thin as 3-64. Special sizes on application. Furnished with both square and radius cutting edges. Tolerance plus or minus .00025.

**CIRCULAR TOOL CO., INC.**

PROVIDENCE 5; R. I.

Chicago • Philadelphia • New York • Dayton • Cleveland  
Los Angeles • Rochester • Indianapolis • Detroit  
St. Louis • Minneapolis





*Logan...*

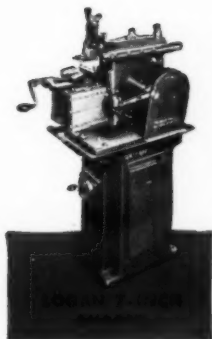
A NAME TO REMEMBER  
WHEN YOU THINK OF  
**BETTER**  
LATHES AND SHAPERS

Logan Lathe  
prices start at  
**\$159.50**

Quick Change  
Gear Cabinet  
Turret Lathe

**PRECISION  
BUILDING**

GIVES LOGAN LATHES  
SUSTAINED ACCURACY AND  
LASTING DEPENDABILITY



V and flat ways of the heavy-ribbed Logan Lathe bed are held to within .0005" of parallelism. The front bearing seat on the Logan Lathe ball bearing mounted spindle can vary no more than .0002". Total spindle runout 12 inches from the bearing is less than .0008". To hold to tolerances like these, one of every seven men building Logan Lathes is an inspector, skilled in the use of the most modern precision instruments. Operations, individual parts, sub-assemblies and completed machines are checked. That is why the Logan Lathe has earned a reputation for sustained accuracy and dependable, low-cost service in all fields of industry. Full information on the complete line of Logan Lathes and Shapers at your Logan dealer's, or on written request.

**SPECIFICATIONS COMMON TO ALL LOGAN LATHES** ... swing over bed, 10½" ... bed length, 43¼" ... size of hole through spindle, 25/32" ... spindle nose diameter and threads per inch, 1½"—8 ... 12 spindle speeds, 30 to 1450 rpm ... motor, ½ hp, 1750 rpm ... ball bearing spindle mounting ... drum type reversing motor switch and cord ... precision-ground ways, 2 V-ways and 2 flat ways.

**DISTRICT OFFICES:** Woolworth Bldg. New York 7, N. Y. CO 7-8024    550 W. Washington Blvd. Chicago 6, Illinois Central 1246    1672 Mission Street San Francisco, Calif. Underhill 16882    700 Commerce St. Dallas 2, Texas Central 4075

5-2

**LOGAN ENGINEERING CO. CHICAGO 30, ILLINOIS**

*A Handy Flexible Machine for the*  
**TOOL ROOM and PRODUCTION WORK**



**NORTON GRINDERS**  
*and Lappers*

# The new NORTON 10" x 20" UNIVERSAL GRINDER

**T**HIS new NORTON Universal will bring economy to your grinding jobs that require a multipurpose machine in this size range.

It is precise; it is extremely versatile; it makes rough cuts as readily as it produces the finest precision finishing. The convenience of its controls and adjustments give it a degree of handling ease that is outstanding.

Here are some highlights:

- Head and Footstock positions interchangeable
- Wheel Spindle designed for right or left-hand drive
- Internal Grinding Attachment hinged to front of wheel slide
- Wheel Head easily positioned for varied set-ups—swivels 360°
- Additional amount of wheel head adjustment in upper portion of slide
- Dovetail surface on front of wheel head for special brackets

Catalog No. 170 gives full details of the Norton 10" x 20" Universal—write for copy.

**NORTON COMPANY, WORCESTER 6, MASS.**

*Distributors in All Principal Cities*

M-555

## A UNIQUE HEADSTOCK

A hollow spindle takes up to 1" diameter stock clear through

No. 10 Jarno taper each end of spindle

Swivels 360°

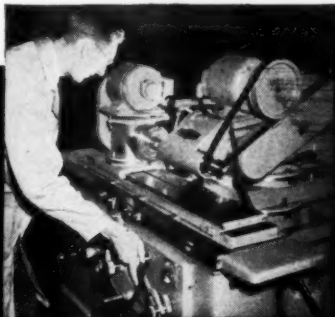
3" standard lathe cam lock nose on one end of spindle

Speed changes from 50 to 500 r.p.m. by finger-tip electronic control


Jogging control provided



**CYLINDRICAL**—exceptionally smooth hydraulic traverse with independent right and left-hand dwell control—automatic wheel feed at each reversal.



**INTERNAL**—individually powered internal spindle permanently hinged to front of wheel slide for maximum convenience and rapid set-ups.



# Surefire

## PROTECTION *for* AIR TOOLS & CYLINDERS



Oil the air that drives the tool, with Norgren Lubricators. Watch sluggish tools become peak producers!

Norgren Lubricators inject any set amount of clean oil into the airstream to create an oil-air fog which travels with the air. Coats all parts with a protective film of oil—smoother operation with less wear while tool works—positive protection against rust and corrosion while tool is idle.

Easy to install in any airline. Automatic. Operates only while tool runs. Sight feed ends guessing.

Act now! Install Norgren Lubricators—the best air tool protection money can buy! Write for catalog No. 400. C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colorado.



# Norgren

WHEN YOU WANT

*More* TOOL LIFE

TRY **BARBER-COLMAN** CARBIDE TIPPED MILLING CUTTERS

This job was slow and costly because of low tool life and high cutter breakage. Three intermittent bosses on cast-iron brackets required the removal of  $1\frac{1}{4}$ " stock. Hard spots and abrasive action of the material combined to shorten tool life by nicking and chipping the cutting edges.

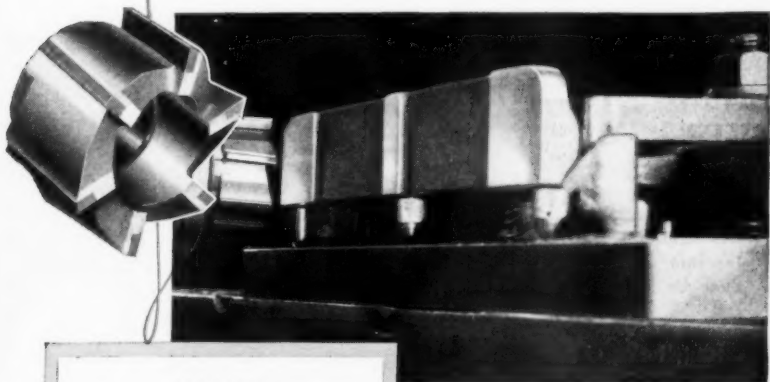
After careful analysis of all factors, Barber-Colman Cutter Engineers recommended the use of carbide tipped shell end mills, with fewer teeth and slight-spiral gashes. Today, experience-tested B-C tip mountings and heat-treated high speed steel bodies are suc-

cessfully withstanding the shock of the hard spots, and tool life and production are increased approximately 400%.

If your job conditions are suited to the use of carbides, consult a Barber-Colman representative on your next production problem. Experience the satisfaction that this manufacturer had in improving operation and increasing production.

**Barber-Colman Company**

GENERAL OFFICES AND PLANT 117 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



**JOB FACTS**

Operation — Face mill 3 bosses removing  $\frac{1}{4}$ " stock, center boss 2" x 1", end bosses 2" x  $2\frac{1}{2}$ ".

Material — Medium cast-iron.

Cutters — B-C Carbide Tipped Shell End Mills,  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " x  $1\frac{1}{2}$ ", slight spiral gashes.

Feed — HSS Cutter 15' per min. C-T Cutter 15' per min.

Speed — 40 S.F.M. 240 S.F.M.

Floor-to-floor — 30-60 in 10 hrs. 90 in 10 hrs.

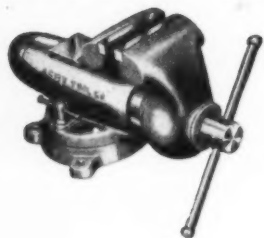
Tool Life — 50 pcs. per sharpening. 200 pcs. per sharpening.



MODERN MACHINES

DEMAND Modern CUTTING TOOLS

# For Dependable Performance Select ACME BENCH VISES



Constructed to give  
Maximum Efficiency and Longer Life  
Moving Parts of High Tensile Semi-Steel Casting.  
Minimum Wear of Moving Parts.  
Chips and Dust Cannot enter Totally Enclosed  
Body.  
Interchangeable and Removable Ground Jaws.  
Made in Sizes from 2 to 6 inches.

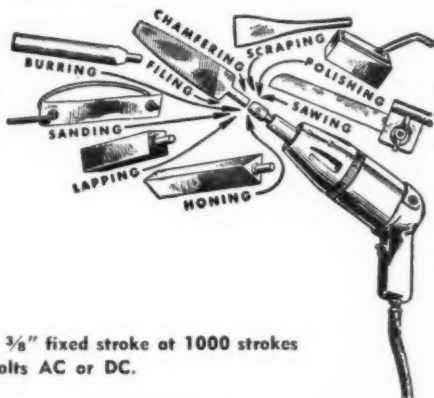
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## B-R-E-A-K . . . . Hand Finishing Bottlenecks

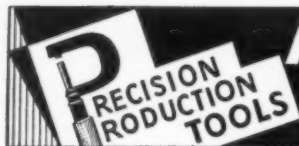
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### PORTABLE • ELECTRIC RECIPROCATING TOOLS

These handy tools will cut  
out many tedious hand filing  
and finishing operations—  
Increase Production—Pro-  
duce Uniform Work.



Light in weight—Delivers  $\frac{1}{8}$ " or  $\frac{3}{8}$ " fixed stroke at 1000 strokes  
per minute—Operates on 110 volts AC or DC.



## ACME TOOL COMPANY

71 WEST BROADWAY

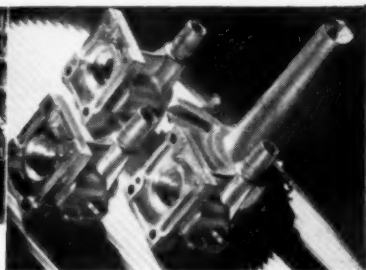
NEW YORK 7, N. Y.

**If you're considering new die casting machinery...**



One of a battery of 5 Model 400 Clevalands in operation in the modern plant of the St. Louis Die Casting Corp., St. Louis, Mo. The operator is removing the casting shown at right.

**why not profit from the experience of others?**



**340 SHOTS PER HOUR!**

Weight of metal per shot 14.35 oz. Weight per piece 4.6 oz.

Zinc fan gear case casting from two-cavity die with movable cores. Most of the cored holes required no further finishing. Three critical dimensions are held to  $\pm .001"$  tolerance. Each casting receives a careful spot check, and at time photo was taken, 170,000 castings had been produced without a single reject.

**ST. LOUIS DIE CASTING CORP.**  
**gets better castings,**  
**faster, at less cost**  
**WITH CLEVELAND MODEL 400's**

These three examples are typical of the production—around the clock—that experienced die casters are getting from Cleveland Die Casting Machines. You too can get better castings, faster, at less cost, with Clevalands.

Let a Cleveland engineer show you further proof of the advantages these machines can bring to your die casting production. For complete information on machine specifications, write now for bulletins.

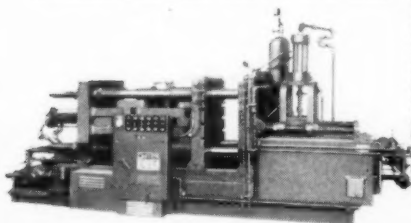
**325 SHOTS PER HOUR!**

Weight of metal per shot 3.3 lbs. Weight per piece 4.75 oz. Zinc nuts cast from 8-cavity die.



**375 SHOTS PER HOUR!**

Weight of metal per shot 1.15 lbs. Weight per piece 1.8 oz. Zinc nobs for electric control panel cast from 6-cavity die.



Cleveland Model 400 Universal High-Pressure Hydraulic Die Casting Machine for zinc, tin or lead. Hot metal end can be easily changed to convert to cold chamber machine. 36" x 38" die plates. Approx. 800,000 lbs. locking pressure.

**THE CLEVELAND AUTOMATIC MACHINE COMPANY**

**4934 BEECH STREET • • CINCINNATI 12, OHIO**

CHICAGO (6) 3710 Civic Opera Bldg. CLEVELAND (14) 1114 NBC Bldg. DETROIT (2) 540 New Center Bldg.  
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# Introducing a new **SMALL SIZE**

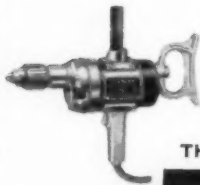
**the No. 24**



## **ELECTRIC DRILL by Stanley**

It's a fist-ful of power . . . for drilling metal, wood or composition materials. Light enough to swing easily overhead or horizontally at arm's length. Compact enough for close-quarter work. Made the way Stanley makes all tools . . . sturdy, for years of useful life. Capacity,  $\frac{1}{4}$ "; length  $8\frac{1}{4}$ "; weight,  $3\frac{1}{4}$  lbs.

**Economical drill press . . .** Locked in the Stanley Drill Stand No. 514, the No. 24 doubles its utility . . . becomes an efficient drill press for a variety of light drilling jobs.



Stanley Electric Drills come in a full range of sizes for wood or metal drilling. Available from Stanley distributors. Write for descriptive literature. Stanley Electric Tools, 512 Myrtle Street, New Britain, Conn.

THE GREATEST NAME IN TOOLS

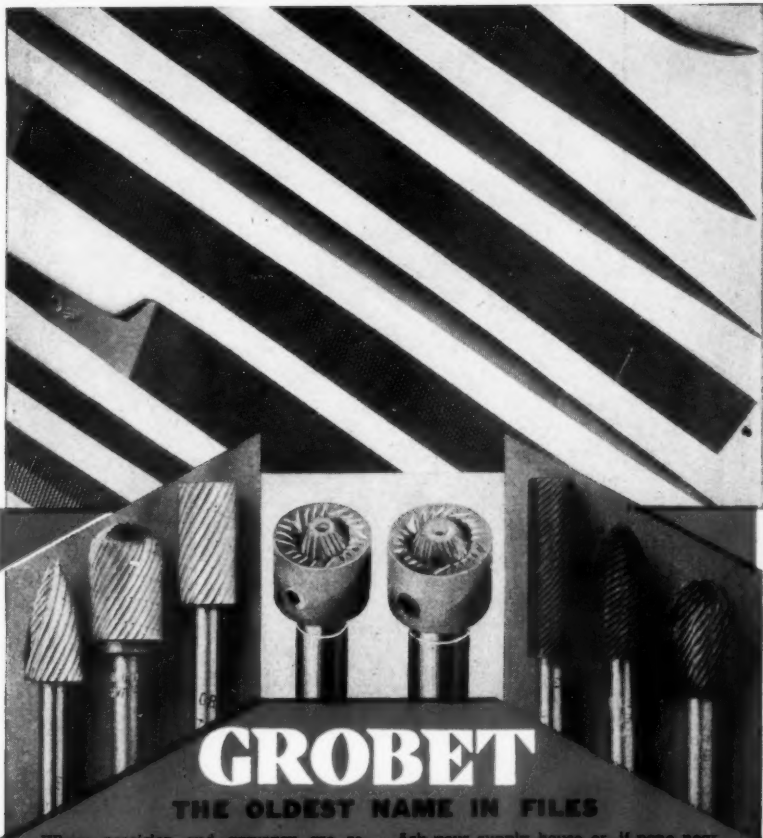
# **STANLEY**

Reg. U.S. Pat. Off.

HARDWARE • HAND TOOLS • ELECTRIC TOOLS

MACHINE and TOOL BLUE BOOK





# GROBET

## THE OLDEST NAME IN FILES

Where precision and accuracy are required, GROBET only, assures the finest workmanship, performance and durability—that's why such undisputed leadership has been maintained for 135 years. Buy GROBET and get the file you need for a specific purpose—not substitutes or "near as good".

Ask your supply house or, if none near, let us know your specifications on GROBET PRECISION genuine SWISS and AMERICAN PATTERN FILES, RIFFLERS, ROTARY FILES, BURS, TUBE DE-BURRING REAMERS, COUNTERSINKS, ETC.—nearly 10,000 shapes, sizes and cuts.

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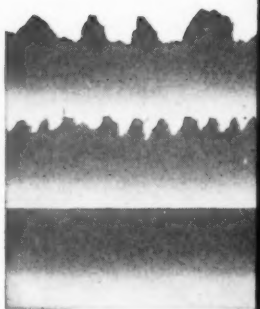
New York, 13 N. Y.

IMPORTERS OF GROBET SWISS FILES

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Plants: New York • Chicago • Los Angeles

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# Forget Surface Variations

**MERZ NEW-MATICS ACCURATELY MEASURE I.D. OR  
O.D. . . . REGARDLESS OF SURFACE CONDITIONS**

● Only MERZ *New-Matic* Measuring Machines enable you to obtain identical I.D. or O.D. readings—*every time*—on parts of like diameter . . . *regardless of surface variations*. In MERZ *New-Matics*, a synthetic ruby button contacts only the highest surface points. Unlike conventional gages—where compressed air directly touches *all* surfaces, high and low alike—MERZ *New-Matics* are unaffected by any surface variations.

For the same reason, MERZ *New-Matics* are the only air-actuated units capable of accurately gaging parts in which perforations or keyways have been machined. MERZ *New-Matic* Measuring Machines also permit accurate gaging to the extreme edges.

For full details on these and many other advantages of MERZ inspection equipment, write for free 20-page book on the *New-Matic* principle of measuring and sorting.

**MERZ ENGINEERING COMPANY • INDIANAPOLIS 7, IND.**

MERZ "Master" *New-Matic* Measuring Machine. Other models for every inspection purpose.



**NEW BUCKEYE**

**STREAM  
POWER**

**horizontal grinders**

**REMOVE MORE METAL IN LESS TIME**



SPEEDS: 3000 to 22,000 RPM. WEIGHTS: 1 to 12 lbs. CAPACITIES: 1/2" to 8" dia.

● Production goes up—costs go down—when you put a Buckeye Stream-Power Horizontal Grinder on the job! Newly designed Stream-Power line also includes Vertical Grinders and Sanders, Air Wrenches, Shears, Nibblers, Reversible Drills and Screwdrivers. You get 26 new construction, performance and maintenance

features. 65 to 70% more power—weight reduced 22 to 29%—they're 9 to 12% smaller.



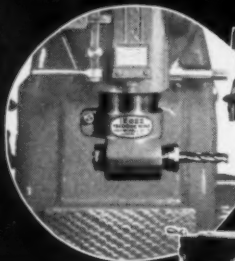
**BETTY BUCKEYE** says:  
Let me send you full information on the new Stream-Power line. Write Buckeye Tools Corp., Dayton 1, Ohio.

**BUCKEYE** *Pneumatic and Electric*  
**PORTABLE POWER TOOLS**

# Increase Production Range with the **NEW** INDEX MILLING MACHINE

VERTICAL • HORIZONTAL • ANGLE MILLING  
BORING • DRILLING

The new Index Angle-Milling Head accurately handles horizontal milling operations of every type including boring and drilling. Change over from vertical to angle milling takes only a few seconds and is done without disturbing the work on the machine table. The attachment can also be used as a cutting arbor or tool holder.

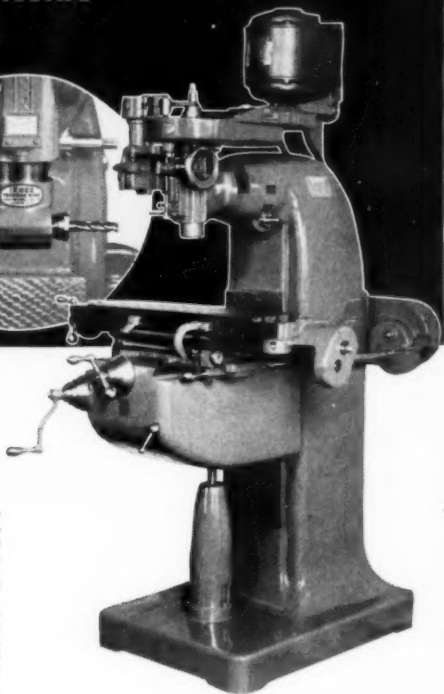


- Automatic Spindle and Table Feed.
- Table Size - 8 x 34".
- Twelve variable cutter speeds up to 2450 rpm.
- Three table speeds can be varied indefinitely.

The Model 50 Index Milling Machine offers a greatly increased range of working capacity over any machine of comparable size or cost, plus a substantial saving on production time and labor. The sound engineering and solid construction of the machine make an extremely rigid unit without deflection or chatter to throw off the accuracy of the work.

A quick change full-geared table feed mechanism delivers power to the table through a splined feed shaft. The Key Way of the Lead Screw is eliminated, further adding to the machine's great precision and sensitive operation. Hand finishing of work is reduced to a minimum.

Other features of the Index Milling Machine include precision ground Lead Screws, large, easy-to-read Angle Dial, Automatic Controls throughout and a full line of accessories.



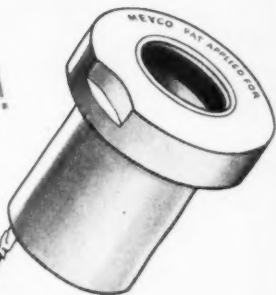
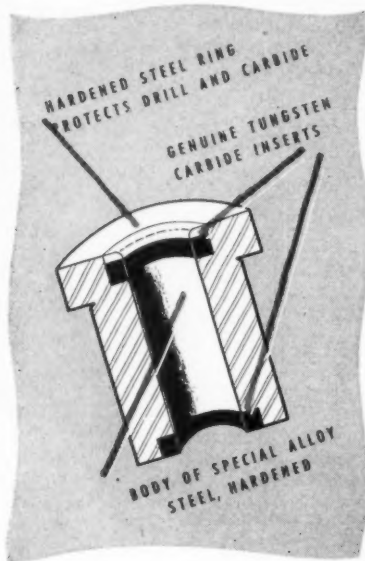
Send Today for the NEW INDEX CATALOG

## INDEX MACHINE Co.

545 N. MECHANIC STREET

JACKSON, MICHIGAN

# A DRILL JIG BUSHING —THAT'S DIFFERENT!



## Meyco Carbide-Inserted Drill Jig Bushings Cost a Little More, But Last Much L-o-o-onger!

● Figure it out yourself: Actual field tests have shown that Meyco bushings with the carbide inserts outlast cast alloy, high speed steel and standard carbon steel bushings by 10 to 50 times . . . yet their cost is approximately 6 to 10 times that of ordinary bushings.

Meyco Carbide-Inserted Drill Jig Bushings will increase the life of drill jigs and fixtures, reduce non-productive machine time and non-productive man-hours, save on spoilage, save on inspection time and increase drill and reamer life.

No change is necessary in drafting room or tool design. Meyco bushings are made to ASA standards.

For information and prices  
write for Meyco Bushing  
Catalog No. 15.



**W. F. MEYERS CO., INC., BEDFORD, INDIANA**

**NEW! yes ALL new**

# **E-Z Set**

## **Boring and Power-facing HEADS**

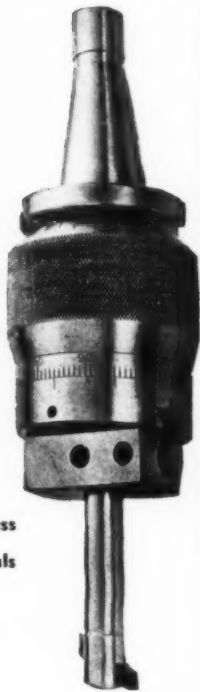
Three Sizes of each model  
Available for any Machine

### **FEATURING**

Unusual Strength      Compactness  
Finest Adjustment      Largest Dials  
Maximum Capacities  
Finest Materials and Experienced  
Workmanship  
Interchangeable Shanks



Model No. 30  
Boring Head



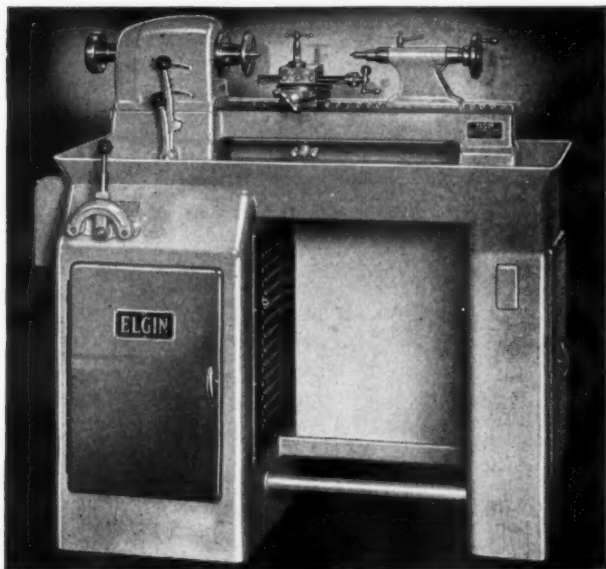
Model No. 40  
Power-face  
Tool

These modern precision tools incorporate all new and practical features required for "All-Purpose" use. Get complete details and amazing price schedule. Write for Bulletin No. 3040.

**THE MAXWELL COMPANY**

**5220 Broadway**

**Bedford, Ohio**



## **ELGIN** Now Provides Operator Comfort

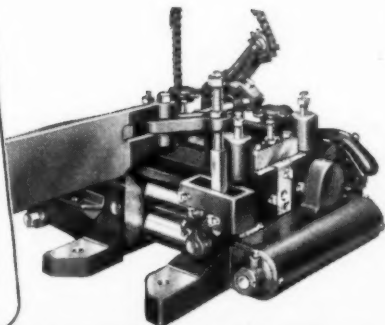
- The "Elgin Line" now is furnished with knee-hole bases with foot rests, permitting operator to sit comfortably, close-up and directly in front of work.
- Motor is mounted in base with direct cross ventilation.
- Three shelves are provided on right hand side.
- Collet board is on left hand door, below the convenient centralized controls.
- Variable speed drive provides stepless spindle speeds from 40 to 4000 rpm.

*Write for full details.*

# **ELGIN TOOL WORKS**

**1772 BERTEAU AT RAVENSWOOD AVE. — CHICAGO, 13 ILL.**

**Assures Fast  
Safe-Accurate  
Feeding of  
Coiled Strip Stock**



## **WITTEK** *Automatic* **ROLL FEEDS AND REEL STANDS**

### **For All Types of Punch Presses**

Wittek *Automatic* Roll Feeds provide maximum efficiency in the high speed automatic feeding of all types of coiled strip stock to punch presses. Highly flexible in function and application, they are capable of feeding lengths up to 24" per stroke of the press and will handle various stock thicknesses in widths up to the maximum width of the rollers.

Wittek *Adjustable* Reel Stands provide automatically expanding coil holders that center the coil and assure maximum production by eliminating looping, tangling and back lash of stock. If your production problem involves feeding coiled stock to punch presses, consult us. Your inquiry will be given immediate attention. Ask for completely descriptive catalog.



**WITTEK Manufacturing Co.**

4305 W. 24th Place, Chicago 23, Illinois

*Automatic*  
**ROLL FEEDS  
and  
REEL STANDS**





# NEW!

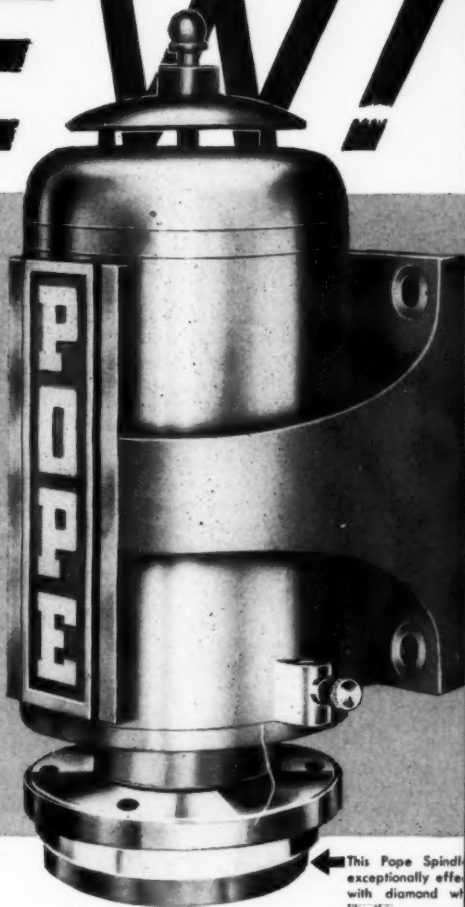
Here is the new  
**HEAVY DUTY**  
**2500 Series**

## **POPE**

**VERTICAL**  
**MOTORIZED**  
**SPINDLE**

available in the following  
work ranges:

R.P.M.	HP
900	$\frac{3}{4}$ , 1, 1½, 2, 3, 5, 7½
1200	1, 1½, 2, 3, 5, 7½, 10, 15, 20
1800	1½, 2, 3, 5, 7½, 10, 15, 20
3600	5, 7½, 10, 15, 20



← This Pope Spindle is exceptionally effective with diamond wheels like this

This POPE Spindle is equipped with *sealed-in lubrication, totally enclosed fan cooled motor, super-precision bearings* and with the power, the bearing capacity and the rigidity to remove metal fast and produce a fine finish.

It is available with flange or tapered nose for quick mounting of various types of grinding wheels.

Recommended for surface grinding, boring and many other machine tool applications.

**Write for new Catalog No. 58**

# **POPE**

**POPE MACHINERY CORPORATION**  
ESTABLISHED 1920  
261 RIVER STREET • HAVERHILL, MASSACHUSETTS  
BUILDERS OF PRECISION SPINDLES

# THIS NEW MADISON ROUGH BORING TOOL SLASHES HOLE COSTS!

This new Madison Rough Boring Tool is the fastest changing, fastest cutting boring tool made. Team it up with the Madison Reaming Cutter and you'll get more accurate finely finished holes at lowest cost. Like the Madison Reamer, the Roughing Cutter can be easily set to decimal sizes within its range. Because cutters may be prezized, disturbance of the setup is unnecessary when inserting a new or sharpened cutter in the bar. Cutter change is a matter of seconds. Simply back off the lock screw in the bar and the cutter slips out for resizing or replacement.

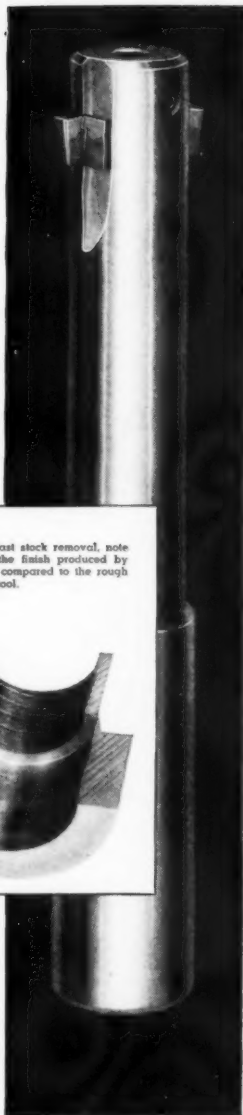
The Madison locating feature automatically centers the cutter in the bar, equalizing the load on cutting elements.

The cutter block is formed by the Madison cutting blades themselves. This exclusive Madison feature creates a more rugged cutter with no delicate mechanisms or separate parts. Madison Roughers have been used to bore holes as large as 17.590 and are made in the smaller range to 1" size.

These exclusive Madison features of simplified design are the reasons why the new Madison Rough Boring Tool performs with amazing speed. On field tests, stock removal requiring three passes with a conventional single point tool was executed in one pass with this new Madison Rougher.



Write for the Madison catalog today. Get the facts on Madison Boreamers, the tools that make one operation out of boring and super finish reaming.



Besides combining accuracy with fast stock removal, note on the production sample below, the finish produced by the Madison Rough Boring Tool as compared to the rough finish produced by a single point tool.

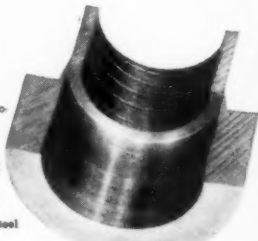
**Material**  
Cast Steel.

**Depth of cut**  
.597".

**Feed**  
.0075" per revolution.

**Surface speed**  
carbide tipped  
355 FPM.

**Surface speed**  
high speed steel  
155 FPM.



**MADISON**  
MANUFACTURING COMPANY  
DEPT. BB-5 MUSKEGON, MICHIGAN



*You can...*  
**SPEED PRODUCTION**

**INSURE ACCURACY**

**LOWER TAPPING COSTS**

with

# SCULLY-JONES STYLE "A" TAP CHUCKS

See their 5 Big Features below;  
then see pages 25, 26, 27 of your  
SCULLY-JONES CATALOG  
No. 500. Write for our  
complete listing of sizes.



## 5 BIG FEATURES

Four-Point Bearing  
—gives collet action

Taper Shank — fits  
any M. T. hole

Collet Action — locks  
tap in chuck

Centers By Shank  
—for correct align-  
ment

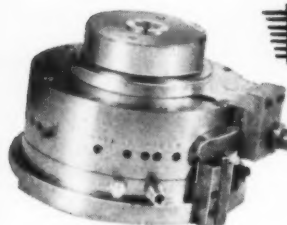
Drives By Square —  
a positive drive

Refer to the Scully-Jones Catalog showing over  
500 types and sizes of cutting tools, collet chucks,  
boring equipment, centers, etc.

**Scully-Jones**  
AND COMPANY

1907 SOUTH ROCKWELL STREET • CHICAGO 8, U. S. A.

# "Air Devices by Redmer"



RC-5

**Redmer**  
AIR DEVICES

## Index Chuck with Air Operated Collet

Eliminates removing chuck from base of machine for changing index position. Index screw posts located on OUTSIDE of chuck. Provides positive alignment and depth control by using stationary type collets. Capacity 1/16" to 2".

**Redmer**  
AIR DEVICES

## Air Foot Control and Valve

Designed to make its operation as tireless as possible. Opening and closing of plunger of valve on foot pedal is operated by a roller on pedal casting which relieves wear on plunger and facilitates operation. Valve is a brass casting which will take plenty of abuse and can be removed from the foot control and used as a separate unit in connection with cam operations.



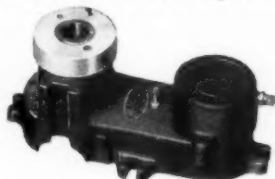
No. FC-28

V-29

**Redmer**  
AIR DEVICES

## Collet Air Chuck

An air operated collet holding fixture using same type collets as Brown & Sharpe automatic screw machines. For drilling, milling, threading, etc., also for assembly work. Six models, No. 00, No. 10, No. 0, No. 2, No. 2 Special, No. 4, Collet Capacity 1/16" to 3 1/2".



Write for literature and prices

## REDMER AIR DEVICE CORP.

9136 West Belmont Avenue

Franklin Park, Illinois

# STANDARD "LOGAN" HYDRAULIC VALVES

OFFER...

*Convenient*  
**REGULATION**  
for Every Control Problem



HAND



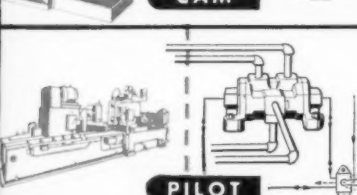
FOOT



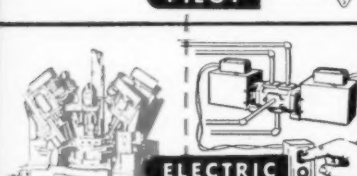
CAM



PILOT



ELECTRIC



## POSITIVE, TROUBLE-FREE PRECISION CONTROL IN THE MOST EFFECTIVE WAY

Precision control of any hydraulic machine or equipment... in the most convenient, effective way... can be obtained with standard valves in the extensive Logan line. A complete range of types and sizes is offered for manual or foot, remote, semi-automatic, automatic, time delayed, interlocking and sequence control of single and double-acting hydraulic cylinders.

Hand operated hydraulic valves are available for oil service in plain, latching, spring return and open center types; for water service in plain and spring return types. Other 4-way control valves include foot, electric solenoid, cam-operated and pilot-operated models. The pilot-operated valves are furnished for either air or hydraulic operating valves having any desired type of actuation. A complete line of relief, reducing, by-pass and speed control valves is also available.

## Engineering Service

Refer your hydraulic circuit problems to Logan engineers for careful analysis and recommendations. Layouts furnished. No obligation for this service.

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LITERATURE

**Logan**

*Air and Hydraulic Equipment*

LOGANSPORT MACHINE CO., INC.



**SAVES**  
\* TIME  
\* EFFORT  
\* MOTION

307 CENTER AVE.  
LOGANSPORT  
INDIANA

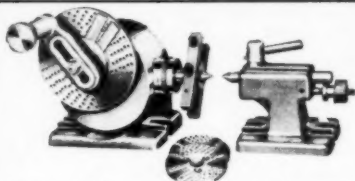
CRACKS • CYLINDERS • VALVES • PRESSSES • RUBBER-FLOW COOLANT PUMPS

# L-W

## HIGH QUALITY UNIVERSAL DIVIDING HEADS

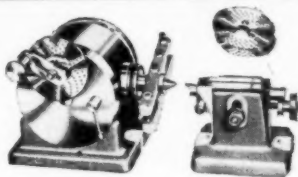
Made by  
America's Largest  
Builders of  
Dividing Heads  
**ACCURATE**  
**and**  
**LOW PRICED,**  
**TOO!**

Well built for hard daily usage. Rugged head and tailstock. Alloy steel spindle has a tapered bearing. Head tilts 90° in vertical position. Special alloy steel worm and bronze worm wheel cut to close limits for accuracy. Complete with three index plates for dividing all numbers to 50 and even numbers to 100, with the exception of 96T. Index chart shows all divisions obtainable to 380.



Model SD 6 1/2" Swing Universal Dividing Head for Smaller Milling Machines

**\$105<sup>50</sup>**



Model BP 11" Swing Universal Dividing Head for plain milling machines.

**\$168<sup>00</sup>**



Model AU 11" Swing Dividing Head Fully Universal for complete indexing and spiral cutting.

**\$242<sup>00</sup>**

Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



DYNAMOMETERS



MAGNETIC CHUCKS



DIVIDING HEADS



RECTIFIERS



DYNAMOMETER SWITCHES



LATHE CHUCKS



UNIVERSAL CHUCKS



POWER HACK SAWS

**L-W CHUCK COMPANY** 23 SO. ST. CLAIR ST.  
TOLEDO 4, OHIO

# HANNIFIN

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*a Plus Value*

...IN THE MACHINES YOU *Use!*  
...IN THE PRODUCTS YOU *Build!*

IT'S a better machine, when it's equipped with HANNIFIN TRUE BORED Cylinders. You get smooth, full-power performance; long, maintenance-free service. Look for the name "HANNIFIN"; it's a mark of QUALITY.

YOU know your product is good and your customers know it, too, when you build it with Hannifin Cylinders. Take advantage of Hannifin service. Cylinders engineered to your requirements. Prompt, dependable delivery.

### ASK FOR A COPY OF HYDRAULIC CYLINDER BULLETIN

A big 52-page catalog listing standard Hannifin Cylinders, complete with specifications, dimensions, and engineering data. Ask for Bulletin 110-Z.

(Above) Hannifin Hydraulic Cylinders contribute to the precision performance of MORRIS MACHINE TOOL COMPANY'S 12 spindle "MOR-SPEED" machine for performing reaming operations on cylinder blocks.

**HANNIFIN**

Nationwide  
Sales and  
Service

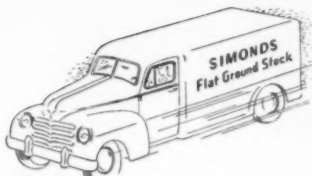
## HANNIFIN CORPORATION

1101 So. Kilbourn Ave., Chicago 24, Ill.

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HERE'S A COST-CUTTING **NATURAL** that you can cash in on *without any delay*. Get Simonds "Red Streak" Oil Hardening Flat Ground Stock from your Industrial Supply Distributor. He has it in all standard sizes... uniformly annealed for easy machining and proper hardening (with directions on the individual envelope)... cut to 18" length... accurately ground to standard thicknesses and widths... with square edges... and with smooth surfaces for accurate layout work.

*No grinding to size.* Just cut it... with Simonds Metal-Cutting Band Saws... to your own designs of punches, dies, gages, jigs, fixtures, templates, stamps, shims, small machine parts, and other items which you now have to order and wait for. Call your Distributor today.



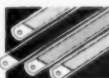
**SIMONDS ALSO MAKES**



Circular Metal-Cutting Saws  
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"Red Hot" Drill Bits



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PLUS A WIDE LINE OF TOOLS FOR CUTTING WOOD, PAPER, PLASTICS

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Other Divisions of SIMONDS SAW AND STEEL CO.  
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Files  
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See Sample

## SIMONDS "RED STREAK" Oil Hardening FLAT GROUND STOCK



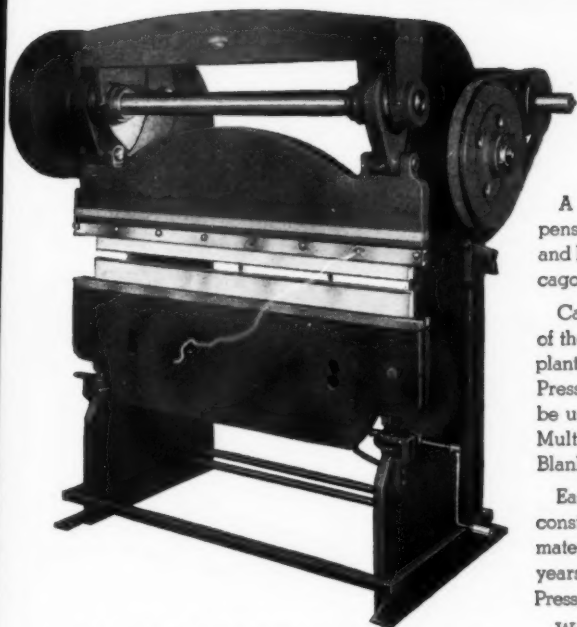
*"When you use Simonds you stay in the Highlands... of consistent cutting efficiency"*



# Powerful CHICAGO

## STEEL PRESS BRAKE

### TYPE "300"



A Small Steel Welded Construction Press Brake  
a brute for punishment and a prodigious worker  
for the Sheet Metal Plant—

—3 sizes—capacities 10 gage, 4 ft. long; 12 gage,  
5 ft. long; 14 gage, 6 ft. long. Powered by  
1½ h. p. motor.

A POWERFUL, rugged, inexpensive Press Brake, designed and built to the standards of Chicago Steel Forming Presses.

Can handle 40 to 50 percent of the work done in the average plant, thereby releasing the larger Presses for heavier work. Can be used for Forming Embossing-Multiple Punching, Notching, Blanking, etc.

Easy of operation, accurate and constructed of highest quality material and backed by over 45 years experience building Steel Press Brakes and Bending Brakes.

World's largest manufacturer of Steel Hand Bending, Power Bending and Power Press Brakes.

A dependable variable speed drive much desired by all users is standard.

**DREIS & KRUMP MANUFACTURING CO.**  
7440 LOOMIS BLVD. . . CHICAGO 36, ILLINOIS

THE BELT METHOD  
IS THE BETTER METHOD

... AND THE BETTER BELT  
IS METALITE!

Back of the brilliant success story of the backstand-belt method, lies the equally brilliant production record of Behr-Manning Metalite\* Cloth Backstand Belts for grinding, polishing and finishing. For the metal finishing industry has had to be shown the advantages of the belt method by competitive tests — tests which so consistently showed production increases of 2 to 4 times the old set-up wheel method.

Metalite Cloth Belts have sold the belt method because, as their name implies, they're right for metal. Their fast-cutting abrasive is genuine Norton Alundum grinding wheel grit, and each sharp, tough crystal is twice anchored with Behr-Manning's own Durabonded\* adhesive that grips and holds under heat or pressure. The cloth backing is rugged and pre-finished for maximum adhesion and resistance to stretching. The Uniflow joint runs bump-free and true. That's why Metalite is right for metal. Write or wire or phone us for your own free demonstration of the belt method with better Metalite Cloth Belts.

\* Reg. U. S. Pat. Off.

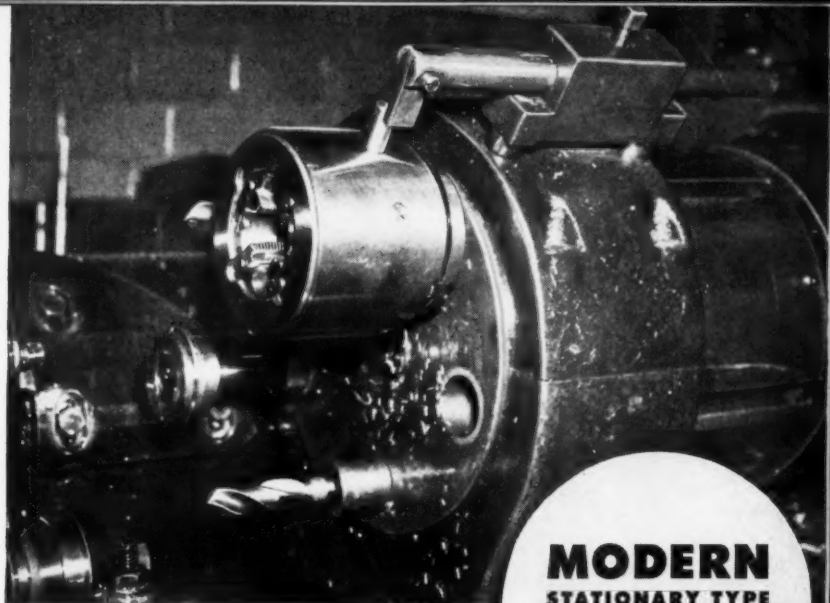


**BEHR-MANNING**

(DIVISION OF NORTON COMPANY)

TROY, N. Y.





Here a Modern Stationary Type Self-Opening Die Head is shown in operation on a Cleveland Automatic. The die head's floating shank compensates for any difference between the lead of the cam of the machine and the thread to be cut.

## MODERN STATIONARY TYPE SELF-OPENING DIE HEADS

Modern Precision Tools  
Include . . . .

STATIONARY SELF-OPENING  
DIE HEADS  
ROTARY SELF-OPENING  
DIE HEADS  
STATIONARY  
COLLAPSIBLE TAPS  
ROTARY  
COLLAPSIBLE TAPS  
MODERN-MAGIC  
CHUCKS AND COLLETS  
SELF-OPENING  
STUD SETTERS  
INSERTED BLADE  
FACE MILLING CUTTERS  
SOLID ADJUSTABLE  
DIE HEADS  
ADJUSTABLE HOLLOW  
MILLING TOOLS  
UNIVERSAL CHASER  
GRINDING FIXTURES

The line of standard Modern Stationary Type Self-Opening Die Heads thread diameters from  $\frac{1}{8}$ " to 7" in standard heads and up to 14" in special heads, accurately, fast and economically. They are adapted to practically every thread cutting operation within their capacity. Designed for use in hand screw machines, turret lathes and other machines where the die head is used in a stationary position and the work revolves.

Complete information will  
be furnished upon request.

# MODERN TOOL WORKS

DIVISION OF  
CONSOLIDATED MACHINE TOOL CORPORATION  
ROCHESTER 10, NEW YORK

# ALCO

## DRILL CHUCKS

COMPLETE RANGE  
OF SIZES FOR  
DRILLS FROM  $\frac{1}{32}$ " TO 1"



ALCO Drill Chucks fit all screw machines . . . Drills are held securely without the use of bushings . . . Full floating feature of the holder insures concentric drilling even on your old machines . . . Each ALCO Drill Chuck has a wide range of adjustability so that one chuck will hold various sizes of drills . . . Produce perfect work faster.

DON'T OVERLOAD YOUR TOOL ROOM  
WITH RUSH ORDERS FOR DRILL BUSHINGS  
- - - USE ALCO DRILL CHUCKS WHICH  
HOLD DRILLS SECURELY *without bushings*.  
MODERNIZE ALL YOUR MACHINES NOW  
WITH ALCO TOOL HOLDERS.

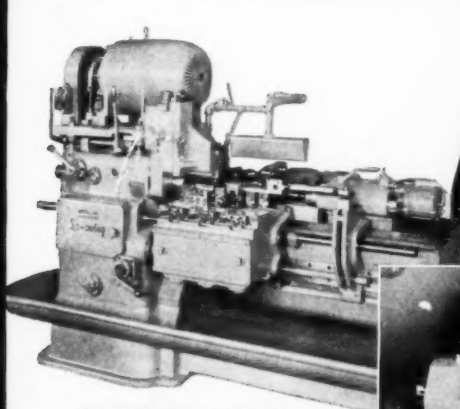
*Send for Complete Catalog No. 4*

# ALCO EFFICIENT TOOLS

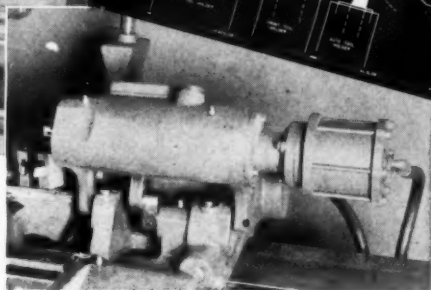
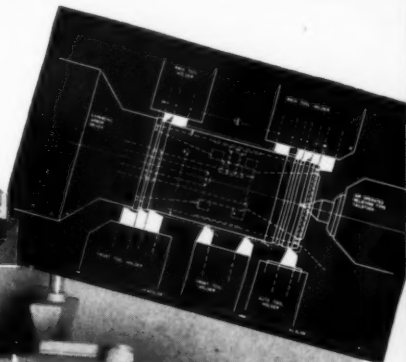
THE ALCO TOOL CO. 252 BIRDSEYE ST. BRIDGEPORT, CONN.  
Chicago Office: 608 So. Dearborn St. — Phone Web. 2868

# MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



## MODEL LR Lo-swing LATHE SPEEDS PRODUCTION ON CYLINDER LINERS



**Problem:** To automatically turn outside diameters, face and groove cast iron Cylinder Liners of various types with Carbide Tools.

**Solution:** Model LR Lo-swing Automatic Lathe is selected for this job because of its demonstrated fine performance with carbide tools, and ease of setting-up due to its Simplified Change-over Mechanism. A Relieving Tailstock which minimizes tailstock spindle overhang, and which facilitates loading and unloading, was incorporated.

The cast iron cylinder liners are delivered to the lathe with the bore machined to size and the large end faced. They are held and driven with an air-operated, expanding collet arbor which extends the full length of the piece. This large area

driving surface permits the high cutting speeds and coarse carriage feeds required for fast production. Loading of the parts is simplified with the Relieving Type Tailstock, shown in the close up illustration. Since the driving arbor is bolted to the spindle nose, the operator is relieved of handling heavy stub arbors generally used when work is held between centers. The outside diameters and the short taper on the tailstock end of the liners are turned with six tools mounted on the front slides; all facing and grooving operations are accomplished with tools mounted on the rear slide. The entire operation is automatic—the operator simply loads and unloads the part and pushes the starting button.

Seneca Falls engineers are at your disposal to assist you with your turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

## PRODUCTION COSTS ARE LOWER WITH Lo-swing

# from FLAT SURFACES

# TO INTRICATE SHAPES



with the New  
**DI-ACRO  
BRAKE**

- **ROK-LOK**—new sensitive material clamp increases accuracy
- **DOUBLE-EDGED FORMING BLADE** allows close reverse bends
- **NEW PRECISION STOPS** accurately control angularity of bends

This versatile metal forming machine was developed for use in model shops, experimental laboratories and production departments where it often replaces dies for all types of precision forming operations. Di-Acro Brakes will form a great variety of materials including copper, bronze, stainless steel, aluminum and bi-metals.

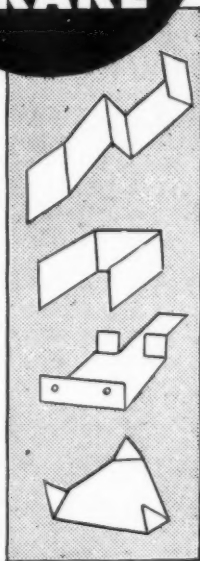
**WRITE FOR CATALOG.** New edition of 40-page Di-Acro Catalog contains detailed information on all Di-Acro Brakes, Shears, and Benders and illustrates how these precision machines can be used individually or cooperatively for "DIE-LESS DUPLICATING".



◀ Di-ACRO is Pronounced "Die-Ack-Re" ▶

**O'NEIL-IRWIN MFG. CO.**

314 8TH AVE., LAKE CITY, MINNESOTA





Hundreds of large die shops and industrial plants have found ACRO PULLERS indispensable for the grinding, mounting and setting of punches. Notice there is no struggle to separate the die set. Acro's Indexed Screw Wrenches\* lift the holder axially from the die shoe. The operator raises or lowers the die smoothly, safely, accurately . . . or he may hold it at any desired height. Time saving . . . money making.

Write for details.

\*Patented . . . Exclusively Acro.

**SAVE UP TO 50%  
OF DIE-MAKING TIME!**

Raise punch holders straight up with no pounding, no prying, no damage to the set . . . no lost time.

Write for interesting details.

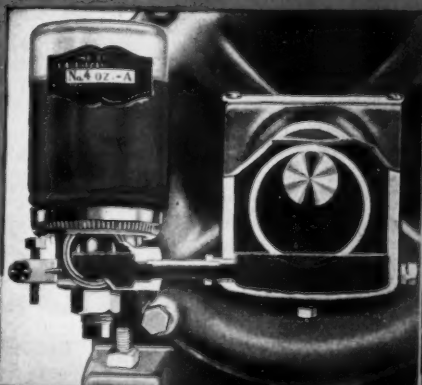
## ACRO LUBRICATORS

### PREVENT BURNED-OUT MOTORS

Authorities say 85% of all lubricating oils never touch the surface intended! No wonder repairs on 3 out of 4 machines are due to faulty lubrication. Save your equipment with ACRO LUBRICATORS. They feed oil to motor bearings automatically . . . no drippage, no waste, no overflow. Famous for "Dual Visibility"—slight glass shows exact oil level on bearing . . . reservoir shows oil supply. Eliminates guesswork.

Send for Complete Information.

\*Another exclusive ACRO design.



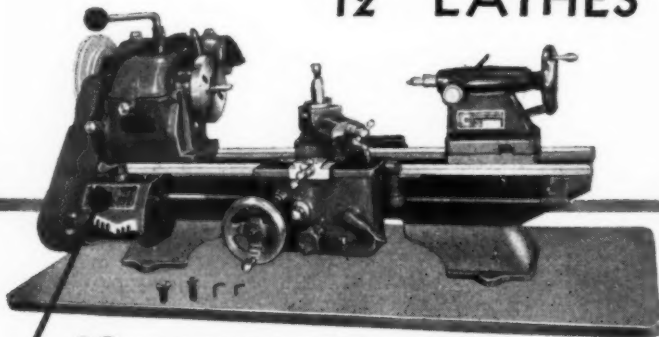
# ACRO

**PROMPT  
DELIVERY**

**METAL STAMPING COMPANY. 332 E. RESERVOIR AVENUE**

# Clausing

## DUAL QUICK CHANGE 12" LATHES



## 48 THREADS AND POWER FEEDS AT YOUR FINGERTIPS

### ADDITIONAL

### *Clausing*

### FEATURES

- Precision ground bed with two flat and two vee ways
- Adjustable Timkin tapered roller bearing headstock
- Ball bearing friction clutch countershaft
- Nine spindle speeds from 33 to 2400 r.p.m.
- Hooded V-belt drive
- Automatic apron

Designed for wide range performance and utmost ease of operation. The Clausing Dual Quick Change 12" Lathe gives instant selection of 48 threads and feeds . . . simply by shifting two levers. Gives finer feeds instantly without stopping lathe. Saves set-up time and operating time on any turning operation requiring power feed. Easy-to-read chart shows lever and gear positions. The Synchronized Gear Box is of "big machine" design and construction. Liberal use of precision ball bearings on which shafts turn readily, with a minimum of friction. Gears are machine cut,  $\frac{1}{2}$ " wide for greater strength and longer life. Compare the Clausing Quick Change with lathes in this price range.

For smooth, accurate performance, greater convenience and lasting satisfaction investigate Clausing Lathes today.

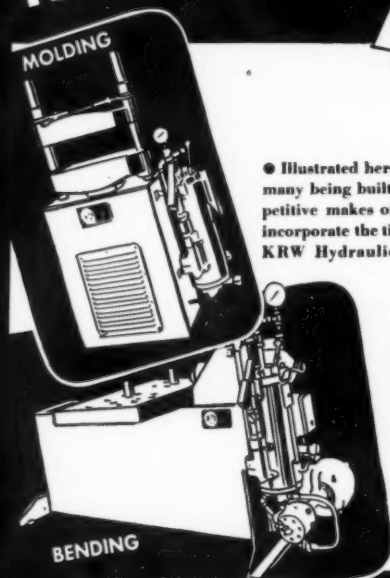
### CLAUSING MANUFACTURING CO.

231 RICHMOND AVE.

OTTUMWA, IOWA

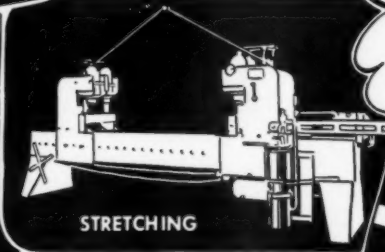
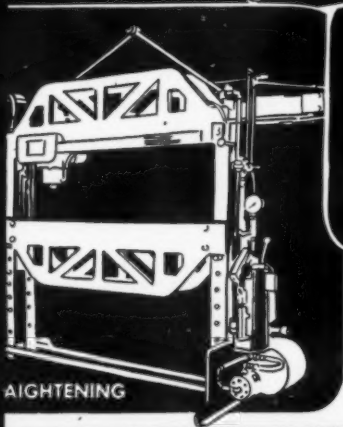


# Name the JOB! *There's a KRW PRESS that can do it BETTER...for LESS*



● Illustrated here are four KRW Hydraulic Press adaptations that are typical many being built by KRW today. All are priced from 30 to 200% less than competitive makes of comparable tonnages or capacities. All are motor-driven, incorporate the time and production proven features that have made the standard KRW Hydraulic Arbor Presses...the most widely used press of their type

America. Take the KRW Sliding Head Straightening Press as an example. This type KRW Press has been effecting tremendous labor savings in fabricating plants where plate must be "ironed up" before it is processed or fabricated. The heavy, hand mallet formerly used was archaic and very costly by comparison. The same story holds true of KRW Stretcher-Levellers, KRW Blanking and Forming Presses, KRW Compression Molding Press, KRW Bending Presses and many others. To save your time and ours, tell us your problem in terms of what you want to accomplish. We'll give you an answer and furnish literature that is pertinent to your needs. Mail the coupon now.



K. R. Wilson, 215 Main Street, Buffalo 3, N. Y.

Please send your catalog. We are particularly interested in you  
 Bending Presses ☐ Compression Molding Press ☐  
 Straightening Press ☐ Stretcher-Leveller ☐ Forming as  
 Blanking Press ☐

First Name \_\_\_\_\_

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City and Zone \_\_\_\_\_ State \_\_\_\_\_

## K·R·WILSON

15 MAIN ST. · BUFFALO 3, N. Y.

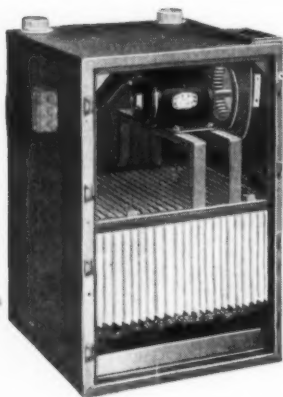
# DUST *is no joke!*

## TORIT



**Torit Dust Collectors, by capturing abrasive dusts, prevent damage to precision equipment and finished parts.**

TORIT Dust Collectors are self-contained units that trap dust from a wide variety of machines, and recirculate the cleaned air. Compactly designed, they occupy little space and require a minimum of piping.



TORIT Dust Collectors range in size from  $\frac{1}{2}$  HP to 5HP. They fit all standard polishing, cut-off and grinding machines, and are easily adapted to special equipment or unusual production set-ups.

TORIT Dust Collectors are moderately priced and exceptionally economical to operate. Standard models are available for immediate delivery. For details and the latest TORIT catalog write:

**TORIT MANUFACTURING CO.**

303 Walnut Street

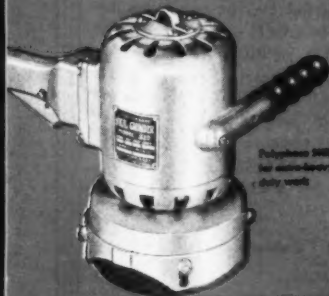
St. Paul 2, Minn.

# Take These Speedy SKIL Grinders



**right to the job for  
finer, faster finishing**

Electric SKIL Grinders are lightweight, easy to carry anywhere . . . balanced right, easy to use everywhere . . . as they pack the punch that assures top grinding speed . . . thousands of jobs. And for long-run economy you can boast their high-quality motors, bearings, gears, shaft housings . . . everything that adds up to lower operating cost per year. See your SKIL Tool Distributor today for demonstration!



Polymorph SKIL Grinder  
for extra-heavy  
daily work

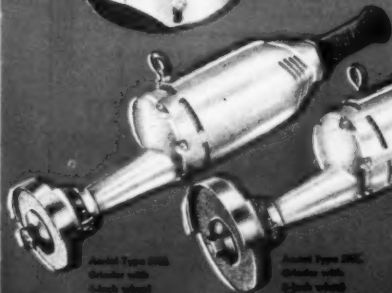
**SKILSAW, INC. - 5033 Melton Ave., Chicago 30, Ill.**

Factory Branches in Principal Cities

by Canadian SKILTOOLS, LTD., 66 Portland St., Toronto, Ont.

# SKIL Tools

TRADE MARK



Model Type 200  
Grinder with  
4-inch wheel

Model Type 200  
Grinder with  
3-inch wheel



SKIL Grinder for  
7/8 - in. to 2 1/8 - in.  
shafts

SKIL Grinder for  
1/8 - in. to 7/8 in.  
shafts

Millions of these



Reg. U. S. Pat. Off.

SOCKET SCREW  
PRODUCTS

- are in use !



A

Pat'd &  
Pats. Pend.



B

Pat'd &  
Pats. Pend.



C

(A) The **Knurled** head of the "Unbrako" Socket Cap Screw makes it slip-proof, fumble-proof and time-saving — even if the fingers and heads are oily: because it can be screwed-in faster and farther, before a wrench becomes necessary. (B) The **Knurled** cup point of the "Unbrako" Socket Set Screw makes it a **SELF-LOCKER** — the point digs-in and "stays dug", regardless of extreme vibration. (C) The **Knurling** of this "Unbrako" Socket Set Screw, as shown, **swages** the threads so it becomes a most excellent "SELF-LOCKER", for use where points such as: flat, dog, cone and oval, which do not lend themselves to knurling, must be used. All of our patented "Unbrako" Set Screws, regardless of point, are excellent **SELF-LOCKERS**—so if it is imperative that your Set Screws stay put, write us, because we can lock most any Set Screw application.

Ask for the name and address of your nearest "Unbrako" Industrial Distributor.

OVER 45 YEARS IN BUSINESS

Knurling of Socket  
Screws originated with  
"Unbrako" in 1934.

**STANDARD PRESSED STEEL CO.**

Jenkintown, Penna., Box 606 Branches: Boston • Chicago • Detroit • Indianapolis • St. Louis • San Francisco

# Now you can combine roll-crushing and diamond dressing in a single wheel dresser to speed form grinding

Before the development of the Moore Panto-Crush Wheel Dresser, diamond dressing and crush-forming of surface grinder wheels called for the use of separate devices. These required considerable set-up and operating skill, particularly where odd contours other than true radii and straight surfaces are involved.

Now with the Moore, permanently mounted on the wheel spindle of a surface grinder, both crush-forming and diamond-dressing are accomplished in a single mechanism.

Here's how this 2-in-1 machine does it:

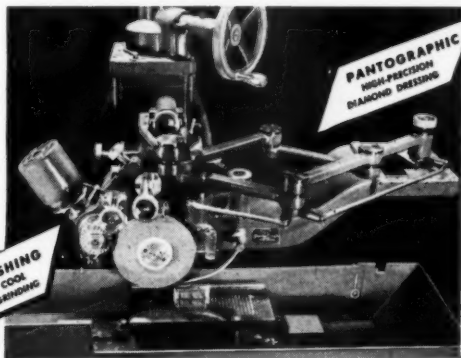
1. Combines Pantograph, working directly from template, and Roll-Crushing in one device, accurately related to spindle.
2. Switches from one method to the other without disturbing workpiece setting or location of either truing device.
3. No setting up of complex attachments each time wheel is dressed...no raising of wheel spindle from work to dress, yet wheel spindle may be raised or lowered without losing relation of wheel form to dressing device...crusher method saves diamond costs.
4. Assures highest roll-crushing accuracy and economy. Crusher roll is ground and used on same spindle, without disturbing position...no expensive machines required to grind crusher roll...no worry about hardening distortion, because roll is ground in place from the solid directly from template.

5. Takes Skill out of job, yet adds advantage of crush dressing for heavy cuts without heating work, and ultra-precision diamond dressing.

6. Device need not be removed to use machine as conventional surface grinder.

Both MACHINE DESIGN and MACHINERY magazines devoted considerable editorial space to technical discussions of the value of this ingenious new mechanism. We'll be glad to send you reprints and a descriptive catalogue on Panto-Crush.

MOORE SPECIAL TOOL CO., Inc.  
728 UNION AVENUE, BRIDGEPORT 7, CONN.



HAVE YOU BOUGHT  
YOUR COPY OF  
"PRECISION  
HOLE LOCATION"?

Over 5,000 copies of this valuable book on toolmaking practices have been sold to date. Available at special price of \$3 in U. S. A.; \$3.50 outside U. S. A. 448 pages, over 400 illustrations. 184 pages of Woodward Coordinate Location Tables from 3 to 100 holes. Send check or money order to Moore Special Tool Co., Inc., Bridgeport 7, Conn.

## Add a MOORE to YOUR TOOLROOM

JIG BORERS • JIG GRINDERS • PANTO-CRUSH WHEEL DRESSERS  
DIE FLIPPERS • COMPLETE LINE OF HOLE LOCATION ACCESSORIES

# We've Got 'em in ALL Sizes!



## **GLENZER** LIVE CENTERS Reduce Tool Breakage

PRECISION  
Frictionless  
LIVE  
CENTERS



Reduces  
Tool Breakage

They're made for use on the smallest toolroom lathes, to the largest railroad shop equipment. Rotors  $\frac{3}{4}$ " to 2" diameters — bodies  $2\frac{1}{4}$ " to 5" diameters. The four types of Glenzer Precision Live Centers (taper shank, slip-over, slip-in and spindle) are made with large taper thrust and annular roller bearings mounted with extreme care, to insure accuracy and long life.

THE J. C. **GLENZER** CO., Inc.

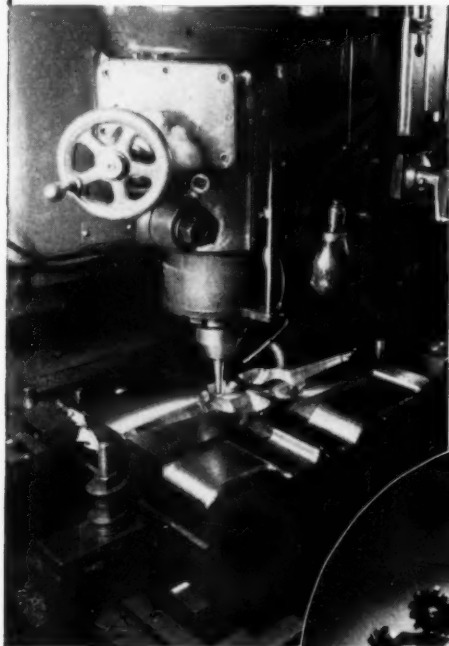
6465 EPWORTH BLVD.

DETROIT 10, MICH.

# Raise the Feed!

## CUT COSTS WITH

# T-J CUTTERS



A T-J Cutter at work on a drop hammer die block for steering knuckles. The material is molybdenum die steel of C45-C50 Rockwell.

Do your cutting in tough die steels *faster*... with less breakage... and *more work between grinds*! Use T-J Die Sinking Milling Cutters! They're designed for accuracy and sturdiness... made from a standard, extremely high grade steel... properly machined... scientifically heat-treated and accurately ground. Many styles and sizes... proved on countless tough jobs! Send for new catalog. The Tomkins-Johnson Co., Jackson, Mich.



FOR TOUGH JOBS SPECIFY

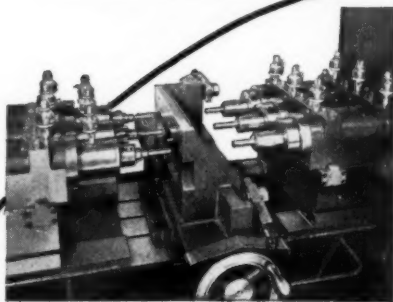


**TOMKINS-JOHNSON**  
DIE SINKING MILLING CUTTERS

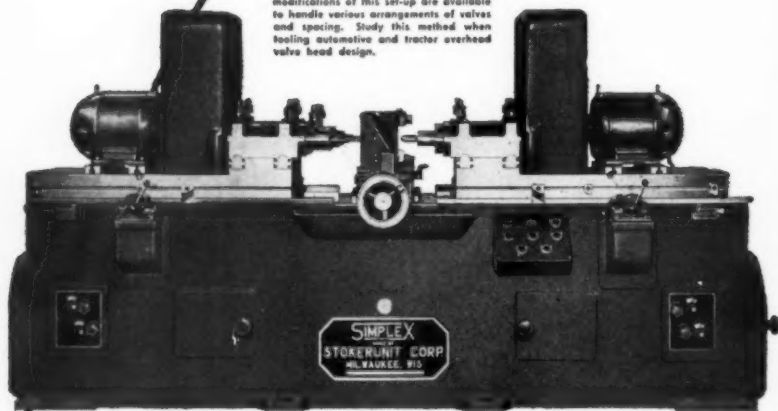
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# SIMPLEX

The life and efficiency of a gasoline engine depends much upon the accuracy of valves and valve guides. One progressive manufacturer found that by placing the cylinder heads for an overhead valve engine in a simple cross-sliding fixture, semi-finish boring one side and precision boring the valve guides and valve seats from the other, he achieved the finest precision and engine performance.



This SIMPLEX 2U 2-way Precision Boring Machine, with three  $\frac{1}{8}$  inch spindles on each side and cross-sliding fixture, bores two intake and two exhaust valve guides and seats in a four step cycle. Many modifications of this set-up are available to handle various arrangements of valves and spacing. Study this method when tooling automotive and tractor overhead valve head design.



## Precision Boring Machines

**STOKERUNIT CORPORATION**

**SIMPLEX Machine Tools Division**

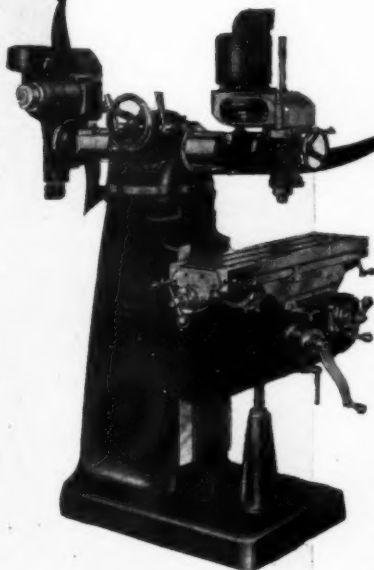
4530 West Mitchell Street, Milwaukee 14, Wisconsin

Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools



# THE PRACTICAL SOLUTION...

TO YOUR  
MILLING  
PROBLEMS



## *The Bridgeport Milling Machine*

The Bridgeport Turret Milling Machine with High Speed Attachment handles milling, drilling and boring at all angles, with maximum ease and convenience. It is accurate and speedy, sturdy and powerful—a precision machine for production demands.

Shaping operations can be performed at all angles, making this attachment fast and practical on die and mold work of all kinds, as well as for intricate slotting on production jobs.

Features include: 15" diameter turret with 5" overarm, rugged construction, table, knee and saddle in convenient front-of-machine position, anti-friction bearings throughout, keyed overarm with worm wheel control for angular settings, large diameter graduated dials.

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# *Bridgeport*

**MACHINES INC.**  
**BRIDGEPORT, CONN.**

**SAVE** on your  
**HEAT TREATING COSTS**  
*in your own plant!*



**HARDEN and TEMPER TOOLS • DIES**

**EFFICIENTLY • ECONOMICALLY**

Now you can save money by heat treating your small parts, tools and dies in Sentry Electric Furnaces. Used with Sentry Diamond Blocks, the scientifically controlled neutral atmosphere will produce full hardness and uniformity of work with no reduction in size, no scale and no decarburization.

Easy to install, simple to operate, these Sentry Furnaces will quality harden any type of high speed or high carbon high chromium steel tools or dies at low production cost even with inexperienced help. For tool or production line, there is a Sentry Furnace to meet your particular requirement.

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descriptive  
catalog  
1054-D7*



**The Sentry Company**  
FOXBORO, MASS., U. S. A.





**PICK THESE  
BLADES**

## **for LONGER CUTTING LIFE**

For most economical production metal-sawing, pick the long-life **GRIFFIN SPECIAL ALLOY**. Molybdenum high speed steel. Machine and hand frame sizes.

To cut stainless, chrome, nickel and all other tough alloys, pick the **GRIFFIN HIGH SPEED STEEL**. 18-4-1 tungsten high speed steel. Machine and hand frame size.

For any hand-frame use, pick the tough, all-purpose **NEW GRIFFIN**. Flexible as a soft-back, durable as an all-hard.

For hand-cutting thinnest sheet, tubing, conduit, etc., pick the **GRIFFIN NON-STRIP**. Teeth don't snap out.

For precision contour cutting, pick **GRIFFIN BAND SAWS**. Four types for metal-cutting and wood-cutting.

Write for latest Griffin Price List, giving full descriptions, sizes, selection tables, etc.

*General Sales Agent*

**JOHN H. GRAHAM & CO. INC.,**

Dept. E, 105 Duane St., New York 7, N. Y.

**ASK YOUR DISTRIBUTOR FOR**



**HACK SAW BLADES *and* BAND SAWS**

Made by G. W. GRIFFIN CO., Franklin, N. H., Hack and Coping Saw Blade Specialists since 1880

# 1 MOTOR TOOL *LIVE* CENTER

WILL *Outlast* A BASKETFUL  
OF *Ordinary Centers*

## *Here's Why!*

You no longer have to guess whether you are overloading MOTOR TOOL Live CENTERS. When the load is too great a RED BAND around the spindle disappears into the housing. You can see at a glance when overloading occurs.

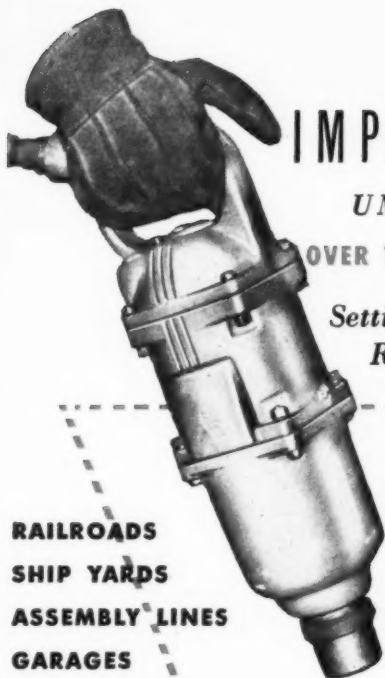
This is an exclusive feature, developed by MOTOR TOOL, that cuts MOTOR TOOL Live CENTER repairs to practically nothing—immeasurably INCREASES their life—and puts an end to burnouts, breakdowns and work spoilage.

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**MOTOR TOOL MANUFACTURING CO.**  
**METAL CUTTING TOOLS**

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**RAILROADS**  
**SHIP YARDS**  
**ASSEMBLY LINES**  
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## IMPACT WRENCHES

*UMATCHED for POWER*

OVER 1000 HARD BLOWS A MINUTE

*Setting SPEED and LOW COST  
 Records on Scores of Jobs*

**METAL FABRICATING**

The Thor Wrench hits **HARD** once on every revolution of its rotor—and with more than 1,000 of these hard impacts a minute is outperforming everything in its class... for *speed* in driving nuts, bolts or cap screws—for *stamina* in standing up longer under impact shock—for *proving the best money saver* on every job! Call a Thor branch today, for a convincing demonstration.

**INDEPENDENT PNEUMATIC TOOL COMPANY**  
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**PORTABLE POWER**

**TOOLS**

**PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY  
 ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS**

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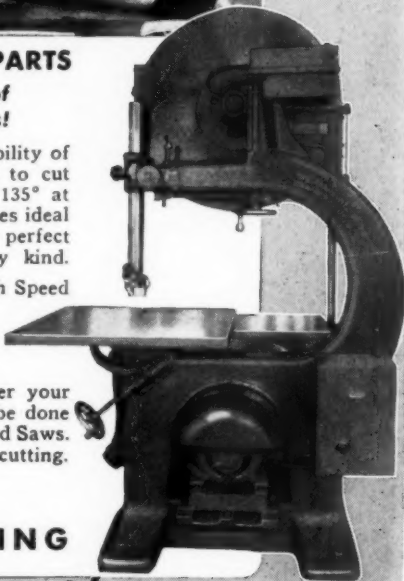
# *The SUPER METHOD*



**of TRIMMING FORMED PARTS  
and performing a host of  
other metal cutting jobs!**

The negligible down-drag and the ability of Tannewitz High Speed Band Saws to cut sheet metal from 90° to near 0 or 135° at tremendous speed make these machines ideal for trimming. Cuts can be made with perfect safety without using a rest of any kind.

Friction sawing with Tannewitz High Speed Band Saws also results in perfectly amazing time savings in the cutting of flat sheets, soft or hardened steels, armor plate, plastics, glass and many other materials. Whatever your cutting problem, chances are it can be done better and faster with Tannewitz Band Saws. Investigate this "Super" method of cutting.



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SAWING**



Write for Your  
Free Copy

*with*  
**Tannewitz**

**HIGH SPEED BAND SAWS**

**THE TANNEWITZ WORKS** **GRAND RAPIDS**  
**4, MICHIGAN**

# The Prutton... TAPMASTER



TAPPING MACHINES IN

1

Speedy; can do three jobs at once, tapping any size hole up to  $\frac{3}{4}$ ". Three separate motors. Single or continuous cycle. Positive feed by husky lead screw prevents tearing of threads. Safe—no jamming of work. Ample tanks for coolant oil—ready accessibility. Descriptive bulletin.  $\frac{3}{4}$ " awning eye-end and  $\frac{3}{4}$ " pipe cap: 1500 per hour on Tapmaster.

WRITE FOR . . .

. . . DESCRIPTIVE BULLETIN

## D. H. PRUTTON MACHINE & TOOL CO.

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CLEVELAND 11, OHIO

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75

# **BEST BUYS**

**FOR PRECISION-QUALITY, PERFORMANCE  
AND ECONOMY OF OPERATION**

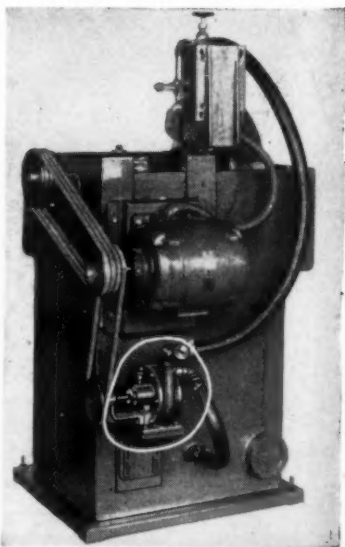


*Write on your letterhead for*  
**FULFLO MECHANICAL DATA BOOK**

## **CENTRIFUGAL COOLANT PUMPS**

**A** lot to claim? Yes! But there's a lot to look forward to when you install these precision-designed, engineered and built coolant pumps.

America's leading industries are users . . . and in their plants FULFLO COOLANT PUMPS do a real job . . . cooling where cooling is needed . . . installed quickly . . . saving money every day. Pipe sizes  $\frac{3}{8}$ " to  $1\frac{1}{2}$ ". Motor, direct or belt drive.



**THE**



**Specialties Co., Inc.**  
**BLANCHESTER, OHIO**



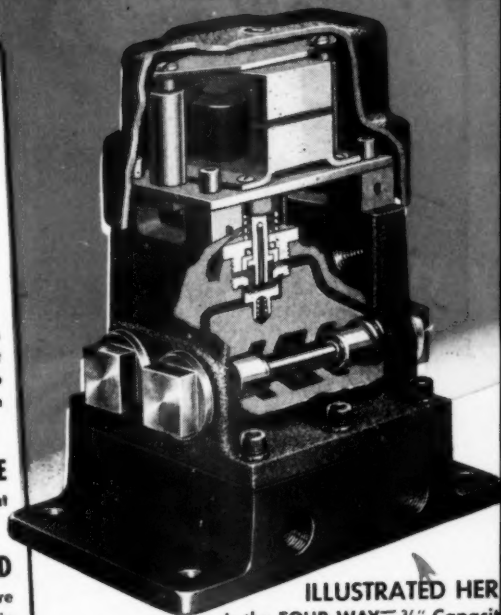
# The *Air Valve* You Have Been Looking For

## PILOT OPERATED • SOLENOID CONTROLLED

### \* A New ROSS Piston Poppet Type Valve \*

- ✓ **FAST OPERATING**  
as high as 400 cycles per minute.
- ✓ **LARGE ORIFICE AREA**  
results in fast exhaust, minimum restriction to air flow.
- ✓ **POSITIVE SEAL**  
by line pressure.
- ✓ **SIMPLICITY OF DESIGN**  
removing end plugs permits replacement of piston poppet assembly—no need to disturb piping or to move valve from position—no "down time".
- ✓ **ECONOMICAL TO OPERATE**  
current consumption 1.2 amps. at 110 volts—60 cycle.
- ✓ **LONG SERVICE ASSURED**  
many Ross valves installed more than 20 years ago are still in active service.
- ✓ **SMALL AND COMPACT**  
appreciated where space is limited.
- ✓ **ALL PARTS**  
non-corrosive metals.
- ✓ **ACCURATELY MACHINED**  
and all parts interchangeable.

A TYPE AND SIZE  
FOR EVERY PURPOSE  
\*  
OVER 100 DIFFERENT MODELS



ILLUSTRATED HERE  
is the FOUR-WAY— $\frac{3}{4}$ " Capacity

*Available in:—*

- **THREE-WAY**  
normally open, or normally closed
- **FOUR-WAY** and
- **FOUR-WAY, Five port**  
may be had in  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ " and  $\frac{3}{4}$ " pipe size

**ROSS**  
*Air Control*  
**VALVES**

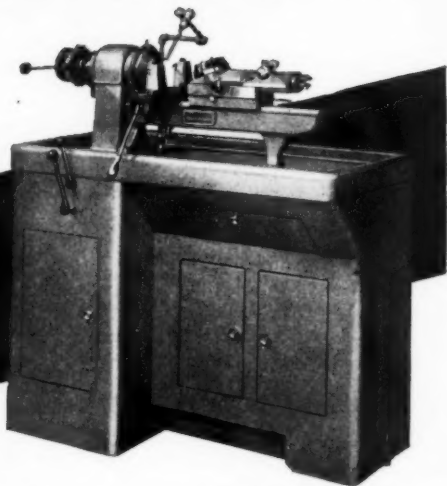
**ROSS Operating VALVE CO.**

6480 Epworth Blvd. Detroit 10, Mich.

THE BRIDLE FOR AIR HORSEPOWER

For Precision Second Operation Work

# Reduce Your Costs With The **WADE** Precision Hand Screw Machine



You reduce your production costs, and save time and money, when you use the Wade Precision Hand Screw Machine for your second operation machine work. This precision machine gives you more units per man hour production because of the many modern advantages in its design.

The enclosed drive gives instantaneous spindle speeds over the complete high-speed range necessary for second operation; spindle bearings are designed to give chatter-free operation and better finished cuts. Spindle speeds are conveniently controlled in ratio of 4 to 1 for efficient tapping, reaming and dieing operations. A self-indexing, automatic clamping turret assures perfect alignment for most exacting work and

## *Complete with New Cabinet*

a scale mounted on the turret head saves time in setting up. The machine requires no additional power service.

The cabinet of the Wade Precision Hand Screw Machine is sturdily and attractively designed with the front cut back to provide knee and foot room for comfortable, less fatiguing operation. This fast working, money-saving machine produces efficient work . . . in larger quantities . . . in less time . . . with a minimum of effort.

# Wade

**Wade Lathes  
Are Better Lathes**

Write today for  
bulletin.

## THE WADE TOOL COMPANY

51 RIVER STREET • WALTHAM 54, MASS.

**STRONG  
IN THE FEATURES  
THAT HELP YOU**

*cut costs*



## **CUSHMAN POWER CHUCKS**



Write for Catalog PO62

A simple, positive, actuating mechanism that is easily adapted to modern machine tools, requires no specially skilled operators, is designed and built for continuous day-in, day-out operation with minimum maintenance and maintained high accuracy.

A full range of chuck styles and sizes . . . featuring the exclusive Cushman "ACCRA-LOCK" Precision Jaw Adjustment on serrated adjustable jaw chucks . . . and including 2-jaw chucks and collet chucks.

New LIGHT-WEIGHT, HIGH-SPEED Air Cylinders that have faster action, more positive control, freedom from danger of grip failure under load.

Simplified hand or foot control valves, and heavy duty air-pressure control accessories.

THE CUSHMAN CHUCK COMPANY, HARTFORD 2, CONNECTICUT

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# Sunnen Honing

## *Cuts Costs - Reduces Rejects*

### **Eliminates Bell-mouth, Taper and Out-of-Round Holes**

The Sunnen Precision Honing Machine produces a straight round hole in any size from .120" to 2.625" in diameter. Extremely smooth internal finishes can be held to a tolerance of .0001", if required.

This low-cost versatile machine duplicates sizes quickly and accurately — saves set-up time because there is no chucking of parts; and mandrels can be changed from one size to another in less than one minute.

Sunnen Honing corrects heat-treat distortion, rapidly removes cut-off and cross-drill burrs and flash from machined and punched parts. Permits final sizing after hardening.

A complete line of abrasives is available to produce any degree of surface finish required—in steel, cast iron, bronze, aluminum, carbides, ceramics, plastic or glass.

Sunnen Honing provides real savings in long run production costs. Even greater savings are possible on job lots and small runs when frequent size changes are necessary.

Write for bulletin, or on request we'll send a honing engineer to your plant.



**SUNNEN PRODUCTS CO.**

7935 Manchester Ave. • St. Louis 17 Mo.

Canadian factory: Chatham, Ontario



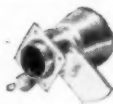
Automobile Distributor Shaft Gears. Taper removed at a rate of 80-90 per hour.



Hydraulic Two-Way Control Valve. Hole is honed to eliminate leakage.



Smooth surfaces provide long life for washing machine parts.



Miniature aircraft cylinder — smooth, accurate honing provides better compression and longer life.



Bell-mouth eliminated, production increased on these line reamer bushings.

# INCREASE PRODUCTION



GENESEE

GENESEE

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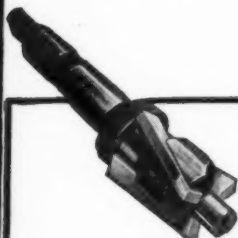
GENESEE

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## ADJUSTABLE HOLLOW MILLS



Other Genesee tools  
that will increase pro-  
duction.

•  
Inserted Blade  
FACING AND  
COUNTERBORING  
TOOLS

•  
SPECIAL PRODUCTION  
TOOLS

There is a Genesee for every hollow milling job. Available in 16 styles. Standard sizes from 0 to 2", with straight or Morse taper shanks carried in stock . . .

- Each size tool has  $\frac{1}{8}$  range.
- Blades quickly ground in a simple fixture.
- All tools manufactured of heat-treated alloy steel.
- Adjusting threads are ground

from the solid and adjusting rings are lapped for extreme accuracy.


- Furnished with high speed steel, cast-alloy, or Tungsten Carbide tipped blades.

Let our Engineering Department solve your Production Tool problems.



➔ Write for  
catalog 45H.

ADJUSTABLE HOLLOW MILLS • FACING AND  
COUNTERBORING TOOLS • SPECIAL PRODUCTION TOOLS



# Westinghouse

says a good word  
for **IDEAL**  
**LIVE CENTERS**

... in the words of G. Young,  
tool supervisor at the Nuttall Plant of  
Westinghouse Electric Corp.,  
Pittsburgh: "Since installing Ideal  
Live Centers we have had no 'down'  
time due to center wear."

What happened at Westinghouse is a typical case history. When they switch to Ideal Live Centers, users save from 20 to 50% and raise the quantity and quality of lathe output. They get deeper cuts at higher speeds with no burning of work or center. There's no friction—no grabbing—no gouging—no time loss on lubricating and grinding—less spoilage—more profit per man hour!

The Ideal "Multi-Duty" Live Center is available from stock with male, female, and pipe type inserts; also Heavy Duty Live Center, built to carry heavy loads—accurate to .0005. Ask for information and free demonstration today. IDEAL INDUSTRIES, Inc., Sycamore, Ill.

Lawrence G. Long, Westinghouse machinist, turning 10" bar F5 #3848 with Ideal Live Center. Feed is .022 @ 200'/min. Tool is Kennametal.



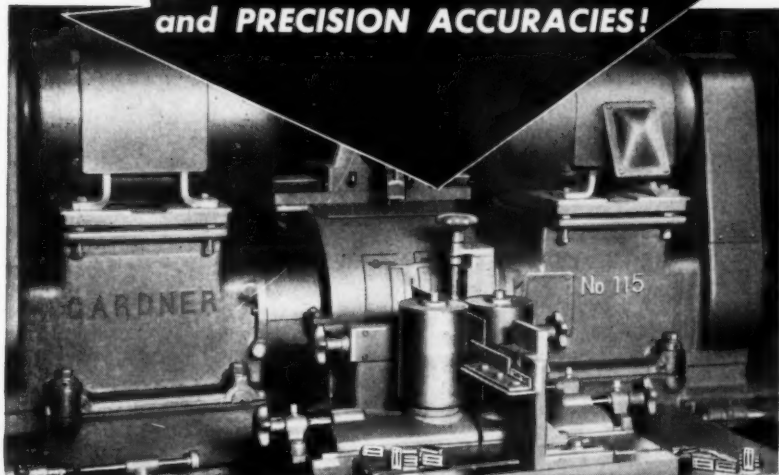
*Distributed Through*

**AMERICA'S LEADING WHOLESALERS**

Canadian Distributor: Irving Smith, Ltd., Montreal

# Gardner-Grind

for **PEAK PRODUCTION—**  
and **PRECISION ACCURACIES!**



**Small parallel-surface parts like these, are  
ideal jobs for GARDNER Double GRINDERS**

**A** SURPRISING variety of parallel-surface parts are being ground today by GARDNER Double GRINDERS—to almost unbelievably close limits, and at profitably high rates of production.

In the example shown above, small, thin aluminum reeds are loaded into a "feed-thru" fixture, employing a pair of rubber rolls that feed the parts between two opposed 15" grinding wheels in a constant stream. Rates and tolerances are shown in the panel at the right.

For the full possibilities of how fast and how accurate your parts can be parallel-surfaced on a GARDNER Double GRINDER —

## WORK DATA

Part *Accordion Reeds*  
Material *Aluminum*  
Operation *Grind Parallel Sides*  
Tolerances *.005" for Parallelism ;  
                  .002" to .004" for Uniformity*  
Stock Removal *.005" to .008" Maximum Overall*  
Production *20 to 30 Pieces per Minute*  
Feed *Hand Load*  
to *Feed-thru Fixture*  
Machine *No 115-15"*  
*Gardner Double Grinder*

**GARDNER-GRIND  
YOUR Flat SURFACES**

**Write for Our Double GRINDING Bulletin!**

## **GARDNER MACHINE COMPANY**

436 East Gardner Street • • • Beloit, Wisconsin, U.S.A.

FOR  
SPEED  
STRENGTH  
ECONOMY

FASTEN

THAT NEW

PRODUCT

WITH

*Chicago*

## AUTOMATIC RIVETING

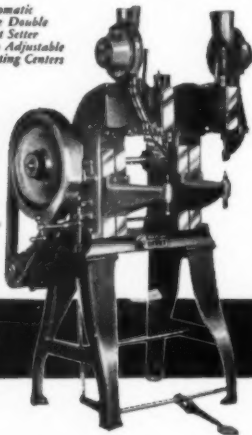
Success or failure of your new product in post war competition may depend on your speed and cost of production. If a fastening operation is involved, Chicago Automatic Riveting will fasten it faster . . . assure strongly fastened assemblies at low unit cost. From one to four tubular rivets or split rivets are fed, inserted and clinched in the split second it takes to release a Chicago foot pedal. Several models of Chicago Riveters are adjusted in just a few minutes to handle different sizes of rivets.

### FASTEN ALL TYPES OF MATERIALS

Chicago Automatic Rivet Setters fasten wood to wood, composition to composition, fabric to fabric, metal to metal, leather to leather,

or any combination of these materials. They clinch grommets and eyelets, and insert drive screws as efficiently as they set rivets. Plan now to assure strong fastenings at higher speed and lower costs with Chicago Automatic Riveting. Write today, for catalog information.

*Automatic  
Type Double  
Rivet Setter  
with Adjustable  
Riveting Centers*



*Automatic Type  
Single Rivet Setter*

### LET US ANALYZE YOUR FASTENING PROBLEM

You can learn, without cost or obligation, how your fastening output may be speeded up, and costs reduced. Just send a blueprint or a sample assembly and ask for a fastening analysis. Our engineers will gladly analyze your particular problem. Production rates can be set up from the report they give. Make use of this expert service, as you plan new products.

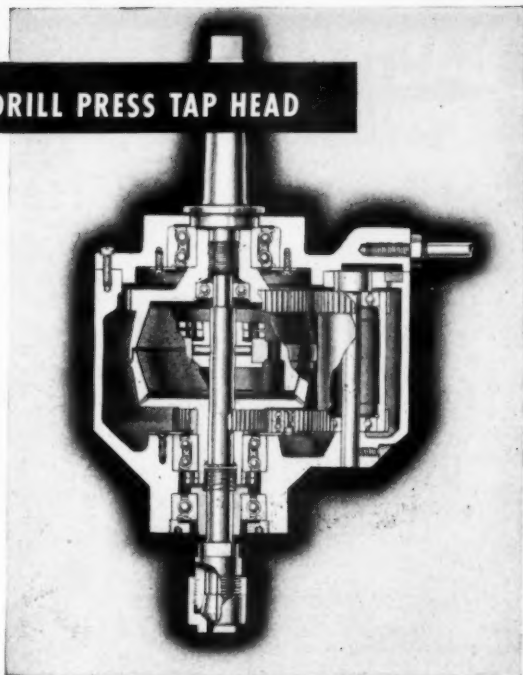
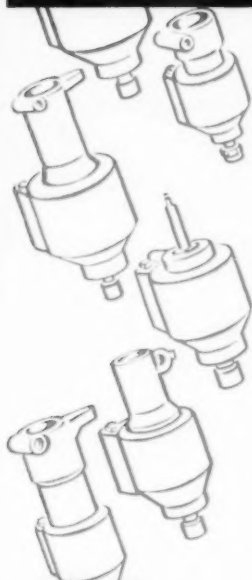
*Chicago Rivet*

**CHICAGO RIVET & MACHINE CO.**  
9610 W. Jackson Blvd., Bellwood, Ill. (CHICAGO SUBURB)





## SNOW DRILL PRESS TAP HEAD



### FEATURES:

- Driveshaft hardened and ground.
- Spindle in balance.
- Light weight clutch
- Spindle bushing revolves with bearing.
- No lateral float.
- Collars ground throughout.
- Eight ball bearings.
- 2:1 reverse speed.
- Hardened alloy gears and studs.
- Delivery from stock.

The SNOW Drill Press Tap Head is the same unit as used on the SNOW Full Universal Tapping Machines. It is the only Tap Head designed and manufactured for a machine tool by a machine tool builder.

Engineers and mechanics will recognize the rigid, sturdy construction; and operators will vouch for length of service, ease of operation, and quality of work produced.

Eighteen years of production testing, and thousands of installations have proven the advantages of using a precision built drill press tap head.

These units are available in three sizes—0 through  $\frac{1}{4}$ " No. 6 through  $\frac{3}{8}$ "; and No. 10 through  $\frac{1}{2}$ "—both Morse taper and quill clamp styles are in stock.

**SNOW MANUFACTURING COMPANY**

441 EASTERN AVE., BELLWOOD, ILL. • SUBURB OF CHICAGO

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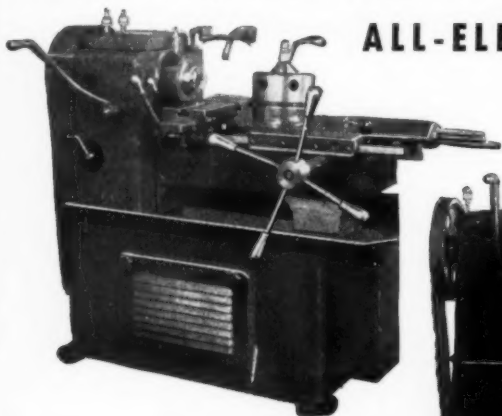


# "BASIC UNIT+PARTS" PLAN

Gives you a Specialized Production Lathe at Lowest Cost

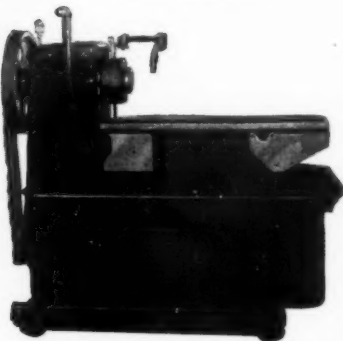
## ALL-ELECTRIC DRIVE

with rapid speed changing and variable speed drive of 0 to 1500 RPM in either direction.



### UTMOST FLEXIBILITY

Above is illustrated the "MINNEAPOLIS" Production Lathe equipped with all-electric variable speed drive. Speed range from 0 to 1500 RPM in either direction provides exactly the speeds needed for any series of machining operations. Any speed desired is instantly obtained with a crank while lathe is running. A dynamic brake operates automatically for quick stopping and reversing.



### BASIC LATHE UNIT

with any one of 4 drives: single speed, low speed chain drive, four speed, or all-electric variable speed as shown above. You can then add only the equipment needed for your particular production "set-up".

## SMALLER INVESTMENT—Lower Production Cost

The "MINNEAPOLIS" Production Lathe is extremely adaptable to any production set-up, particularly second operation work. Its simplified design and ease of control enable inexperienced operators to turn out high speed volume production.

The "MINNEAPOLIS" has  $2\frac{1}{4}$ " collet capacity, 14" swing, heavy duty spindle assembly. It is backed by more than 50 years' designing and manufacturing experience. Send for literature — write us your production problems. Send sample part or drawing if possible — let us quote you on a "tailor-made" lathe for your work.

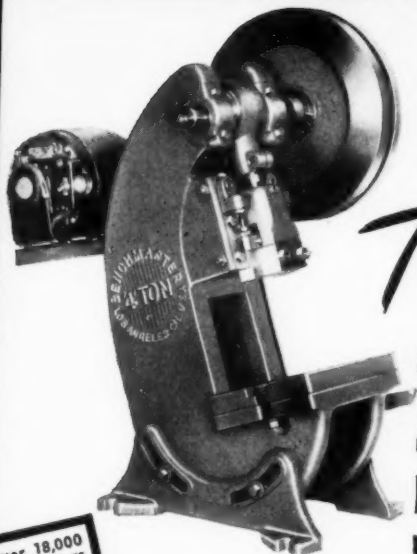
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Minneapolis 13, Minn.





Over 18,000  
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Now in Use

*Throughout  
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**28** countries agree on  
**BENCHMASTER**  
UTILITY and PERFORMANCE

These smooth operating little presses have a trouble-free way of operating day after day, of setting record after record for production and versatility of application. **LOW INITIAL COST** is one of the many reasons you can profitably use a Benchmaster, even where punch presses aren't ordinarily considered. And fewer tools have a wider diversity of uses or a better testimonial for satisfactory performance than Benchmaster—proved by acceptance and use of more than 18,000 in 28 countries throughout the world!

### **BENCHMASTER 4-TON PUNCH PRESS**

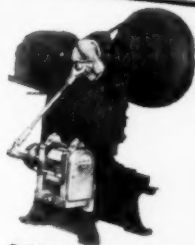
**HIGH SPEED**—285 strokes per minute.

**LONG LIFE**—Replaceable bronze bushings at important wear points.

**TOP STRENGTH**—Nickel semi-steel frame.

**MAXIMUM CONVENIENCE**—Cradle mounted, inclinable open-back construction.

**CAPACITY**—Choice of 1" or 1½" stroke standard. 1½" and 2" stroke available. Bed area 6" x 8". Die space 5¼" to bolster plate, ram up.



#### **ACCESSORIES:**

**BENCHMASTER AUTOMATIC FRICTION ROLL FEED** bolts to Benchmaster (and most other presses) for either front or side feed. Handles stock up to 3" wide x 3/16" thick. Adjustable feed: 0" to 3" per stroke. Adjustable for die height. Uniformly feeds strip or roll stock of metal, wood, plastic, cardboard, felt, etc. Saves labor, adds operator safety, assures uniform, high production.

**Write Dept. MT-5  
for information**

***benchmaster***

**MANUFACTURING COMPANY**  
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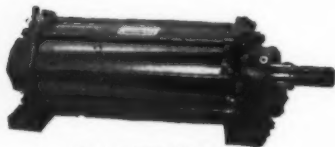
**WORLD'S LARGEST PRODUCER OF SMALL PUNCH PRESSES**

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of Plymouth, Indiana, U.S.A.

These air cylinders are made to your order with any length stroke you request in any of these bore sizes: 1½, 2, 2½, 3, 4, 5, 6, 8, 10

In ordering please write mounting, bore, stroke and piston rod thread you want.



Series "E" Model 1300  
Foot Mount



Model 5213 Hand  
Lever Operated Four  
Way Air Valve



Plymouth Model 5422  
Pilot Operated 4 Way  
Valve

These valves are made to operate double acting air cylinders. They have ½" pipe thread inlet and outlet air ports. They have full size air passages without restrictions that permit the fastest action.



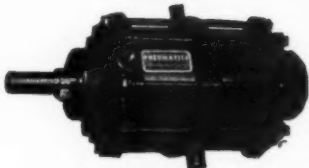
Model 5323 Foot  
Operated Four Way  
Air Valve

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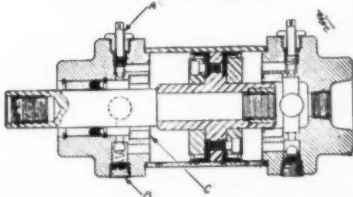


Series "E" Model 1200 Front  
Flange Mount

Series "E"  
Model 1300  
Rear Flange  
Mount



Series "E" Model 1100  
Trunnion Mount



Metering Needle  
"A" Ball Check  
"B" and Bushing  
"C" May be  
added if cushion is  
requested



Model 5522  
Plymouth Single  
Solenoid Operated  
4-Way Air Control  
Valves

**PNEUMATICS INCORPORATED**  
OF PLYMOUTH INDIANA



# 4 POUNDS LIGHTER ...TURNS OUT MORE WORK

**T**HE new Rotor No. 44 Sand Rammer this foundry has stepped up production because it gives a snappier, faster blow and it is easier to handle . . . 4 pounds lighter than the previous rammer.

There's a Rotor Rammer for every job . . . light or heavy duty . . . bench or floor model. Write for free copy of Bul. No. which gives the whole story.

AIR O'TOOL



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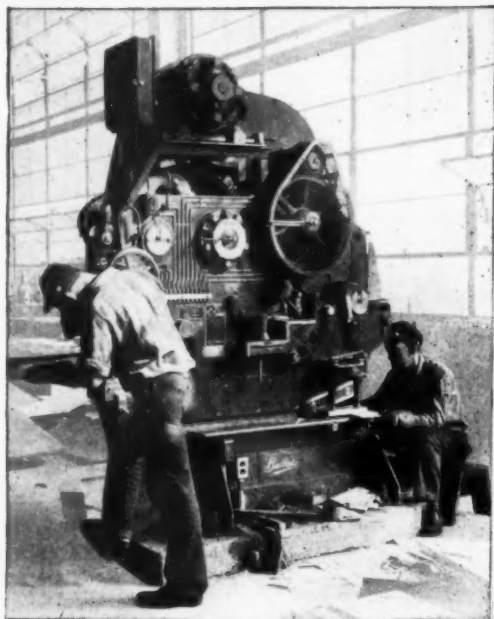
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The "Buffalo"

Universal Iron Worker cuts, punches, notches, slits or copes angles, tees, flats, rounds, squares, special shapes . . . with accurate speed that *makes your man-hours count!* Handles three operations at once! Write for the facts on Universal Iron Workers now!

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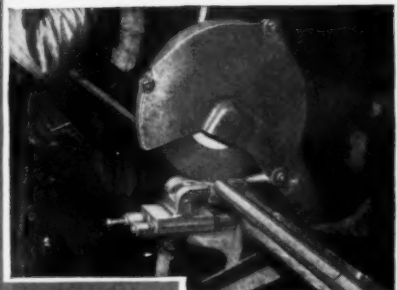
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**"Buffalo"**

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- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END  
PUNCHES AND SHEARS
- ★ LOCOMOTIVE  
SHEARS
- ★ MILL TYPE  
SHEARS
- ★ RAPID ACTING  
PUNCHES
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- ★ DRILLS FOR THE  
PRODUCTION LINE —  
DRILLS FOR THE  
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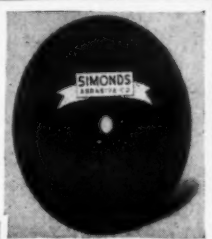
## the grinding job

Cutting-off 1 1/4" Hex Hollow Drill Steel to various lengths on a high speed abrasive cut-off machine. This is a continuous production job where fast cutting action and long wheel life are essential.



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Borolon resinoid A30-S7-B1, 14" x 1/8" x 7/8", adopted as standard for this job because of its exceptionally efficient performance. Withstands the severe stress and strain of high speed operation. Ideal for cutting steel and alloy steel bars, rods, angles, tubing, etc.



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Complete line includes  
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For the utmost wheel efficiency on every grinding job from roughing to finishing you can count on Simonds Abrasive Company Grinding Wheels — products backed by their manufacturer's experience as a leading producer of grinding wheels and abrasives exclusively, for over 50 years—products quality controlled from the crude abrasive produced by Simonds Canada Abrasive Company, Ltd., to the finished wheels available through our distributors. For consistently high quality results use Simonds Abrasive Company Grinding Wheels.

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# Koett Universal ATTACHMENT



## "A Versatile Machine Tool" for Grinding—Boring—Milling and Drilling

A versatile machine tool that attaches to most any machine in your shop, which is easily changed over to other operations, by a thirty second Quill Change.

**Speed & Power for Carbide Tools.** Not necessary to anneal dies for reworking. Mount the Koett on a milling machine and do the work with carbide tipped end mills or carbide rotary files. Powered by  $\frac{3}{8}$  H.P., Universal A-C, DC Motor with rheostat control, which allows compensation for wheel wear.

**Long life** engineered into this precision tool. Guaranteed not to overheat. Lubrication sealed in at factory, for life of machine.

Horizontal Travel approx. 2"

Vertical Travel approx. 5"

Tilt up to 30" right or left

May be run in any position.

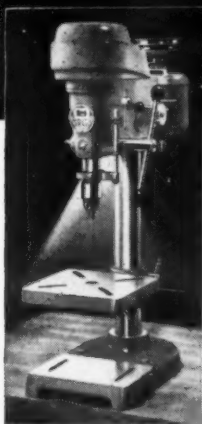
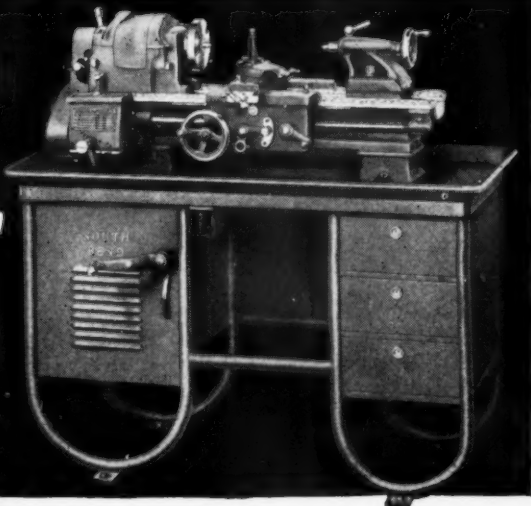
**Accessories:** Internal Grinding Quills, Milling Quills, Boring Tools, Collet Adaptor with up to  $\frac{3}{8}$ " collets, Drilling Quills, Special Quills.





# SOUTH BEND

## 10" Precision Lathes



### NEW SOUTH BEND 14 INCH DRILL PRESS

A ruggedly constructed drill press for precision work. Has built-in shielded illumination. Drill capacity  $\frac{1}{2}$ " in steel. Priced at \$98, f. o. b. factory, bench model; less motor.



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Building Better Tools Since 1906

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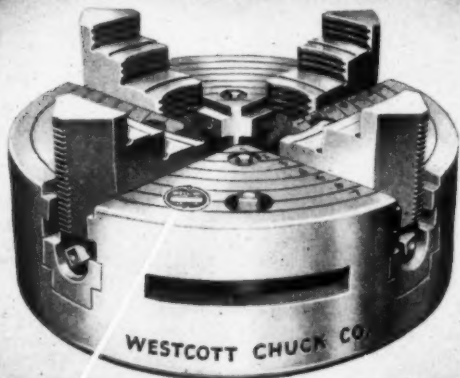
Catalog No. 187-YS South Bend 10"-1" Collet capacity Quick Change Gear Bench Lathe illustrated. Price—f.o.b. factory with 3 ph., 60 cy., 220 v., A.C. motor; drum switch; and bench

**\$933<sup>60</sup>**

Capable of performing the most exacting operations on production and toolroom work, South Bend 10" Precision Lathes are made in quick change gear and toolroom models, mounted on either metal benches or floor legs.

They have  $10\frac{1}{8}$ " swing over bed and saddle wings;  $14\frac{3}{4}$ " to  $32\frac{3}{4}$ " between centers; and 12 spindle speeds from 50 to 1357 r.p.m. South Bend Lathes with 9", 13",  $14\frac{1}{2}$ ", 16", and  $16\frac{1}{4}$ " swings; Turret Lathes with  $\frac{1}{2}$ " and 1" collet capacities; chucks, tools, attachments, surface plates, etc., are also available for immediate delivery. Time Payments can be arranged. Write today for catalog.

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Look for the Red Name Plate  
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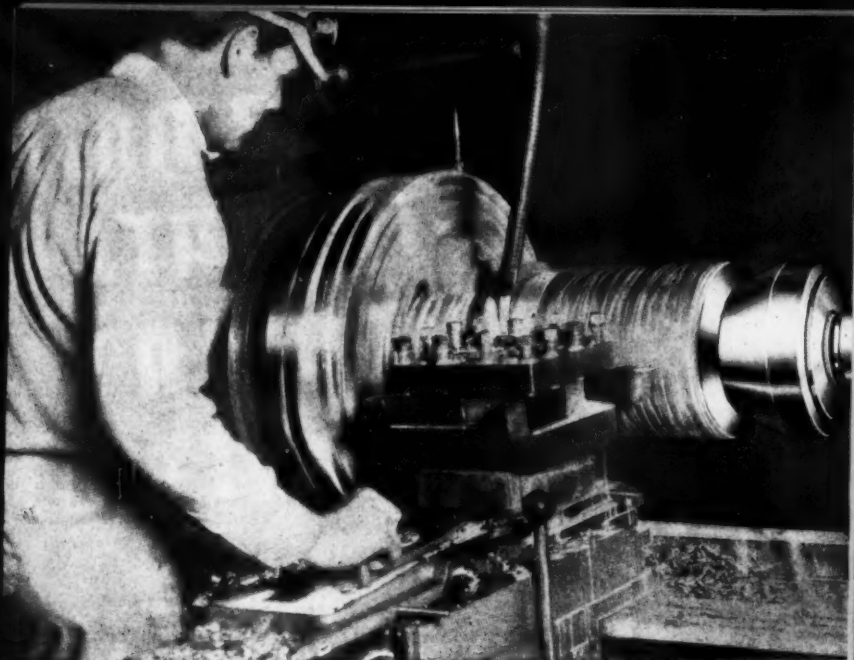
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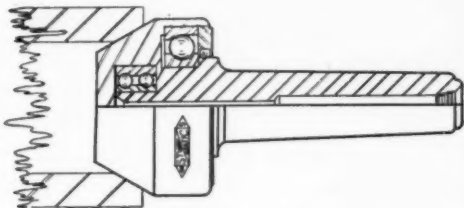
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• The basic design of the STURDIMATIC Live Center is ideally adapted to tube turning . . . extra large sections are no problem with this set-up . . . in most of these cases (see mechanical drawing) there is a tool clearance . . . Characteristic of all STURDIMATIC design is this low overhang which together with a slight cushioning action, that compensates for expansion, due to heat, shock and excessive thrust loads—reduces wear to a minimum . . . we will see that your job gets set-up with the right LIVE CENTER . . . STANDARDS with Morse tapers (2 to 6) carried IN STOCK.

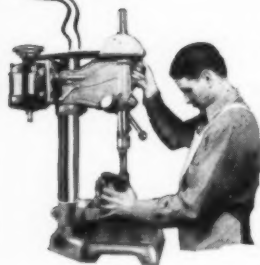


Special LIVE CENTER for turning extra large tubing.

**STURDIMATIC** **TOOL COMPANY**  
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**LIVE CENTERS**

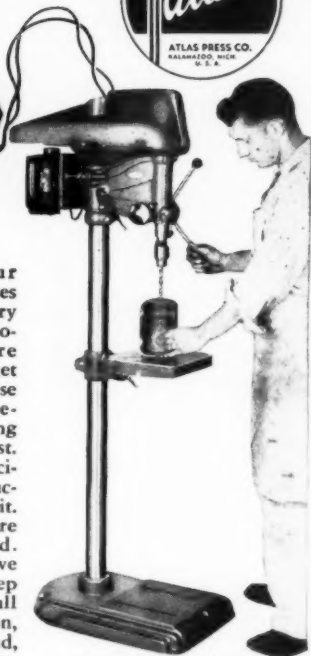
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**TODAY'S Big Drill Press  
VALUES Carry This  
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• Whatever your needs for drill presses—tool room, laboratory maintenance, or production—there are none on the market today that excel these Atlas drills in precision, long wearing qualities, and low cost. Comparisons of specifications and production records prove it. The reasons why are easily appreciated.

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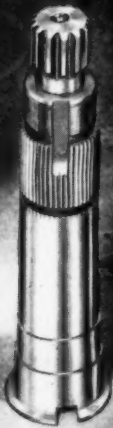
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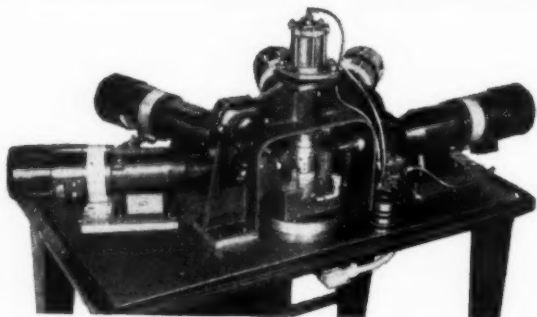
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WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF FRACTIONAL HORSEPOWER GEARS



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The above set-up, designed by D. A. Smith & Co., Detroit, for drilling 20 holes at three levels through a 9/16" wall of a cast-iron bushing, is an example of how Govro-Nelson Automatic Drilling Units can be used to simplify a complex drilling operation.

With the 5 Govro-Nelson Units so arranged that two are on the top level, two on the bottom level, and one on the center level, 5 holes are drilled at once. The machine indexes 4 times to drill the 20 holes, completing the cycle in 72 seconds per piece.

If you have a multiple drilling operation that you would like to speed up, tell us your problems. We shall be pleased to quote on drilling units only or on the complete machine. Literature sent upon request.

**WRITE FOR**  
*Literature*

### GOVRO-NELSON CO.

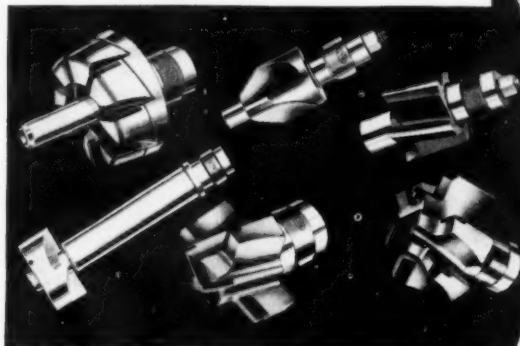
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for 25 Years*

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*Automatic*

**DRILLING UNIT**

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### ...with **CONTINENTAL** **INTERCHANGEABLE COUNTERBORE**

The Continental Counterbore is a favorite standard cutting tool in all types and sizes of machine shops. It is of rigid and simple construction with patented features. The Continental indestructible drive is composed of two driving lugs formed on the cutter shank, with two corresponding abutments on the inside of the holder. There is an

aligning bearing above and below the driving lugs that brings the cutter and holder concentric, and prevents the cutter from being forced out of alignment. The cutter and holder are engaged and disengaged by simply revolving the cutter a quarter turn by hand. No tools or other equipment are necessary.



48-32.



Continental Interchangeable Counterbores are available in a choice of three sets. Set No. 1 (illustrated), for the small shop, includes cutters up to 1 1/16" diameter, with two holders.

### CONTINENTAL TOOL WORKS

DIVISION OF EX-CELL-O CORPORATION

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# THE CONE AUTOMATIC MACHINE COMPANY



SEES MANY

GOOD THINGS AHEAD

## It is reported that . . . . .

The new Kathleen coal mine in DuQuoin, Illinois, is using "fireless blasting," a new method that substitutes compressed air at 10,000 lbs. per sq. in. for explosives.

*get ready with CONE for tomorrow*

A tiny wind tunnel 10 inches square is being built at the University of California to study air flow at supersonic speeds at high altitude pressures.

*be ready with CONE for today*

Shell Chemical Corp. now has acrolein in large-scale commercial production.

*get ready with CONE for tomorrow*

Warsaw Elevator Co. has applied "fluid drive" to elevators.

*be ready with CONE for today*

Engineering studies have resulted in a new slope design for the banks of canals. If the engineers are correct, the rebuilding of the Panama Canal at sea-level is not only practical, but would make it invulnerable to attack by modern weapons.

*get ready with CONE for tomorrow*

Westinghouse Electric Corp. is using radioactive isotopes in fundamental metallurgical studies.

*be ready with CONE for today*

Ohio Power Co. safely spliced a pole-mounted 66 kw. electrical power conductor without de-energizing the line.

*get ready with CONE for tomorrow*

A new vacuum cleaner for factory floors is driven by a gasoline engine and is claimed to clean an "acre-an-hour." It is made by G. H. Tennant Co., 2551 N. 2nd St., Minneapolis.

Swallow Airplane Co. of Wichita has a lock nut with fiber insert which is removable and replaceable.

*be ready with CONE for today*

Westinghouse has a new idea in the design of electric locomotives. By standardization they have made it possible to assemble locomotives on a "building block" principle, giving the buyer an essentially custom-made piece of equipment built with standard parts.

*get ready with CONE for tomorrow*

Acetylene gas will be produced commercially by the electric discharge process at the Houston Oxygen Co.

## FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION



## ADAPTABLY CONOMATIC

The value of a machine depends on the work it does and how well it does it. The utilization of 25 tools in a total of 6 seconds to produce the two parts of the piece shown is the work of an adaptable machine well done.

Ask your CONE representative to show you our new color motion picture



# CONE

AUTOMATIC MACHINE CO., INC., W. WINDSOR, VERMONT, U.S.A.

Several newspapers are interested in the new mill of the Gary Paper Mills in Gary, Ind., where newsprint will be reclaimed by removing the ink.

*be ready with CONE for today*

Instrument Development Laboratories of 229 West Erie St., Chicago, have an instrument the size of a fountain pen for measuring radioactivity.

*get ready with CONE for tomorrow*

Reynolds Metals Co. will now fortify its aluminum paints against fungicidal growths and molds.

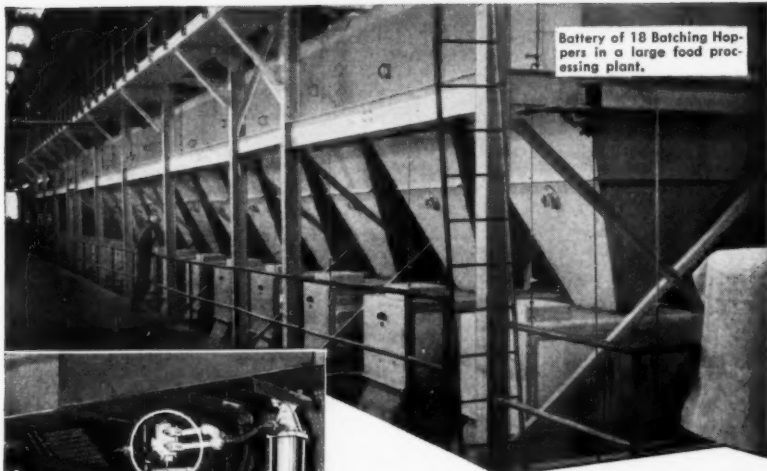
*be ready with CONE for today*

B. F. Goodrich is making conveyor belts of glass fabric to carry loads too hot for other materials.

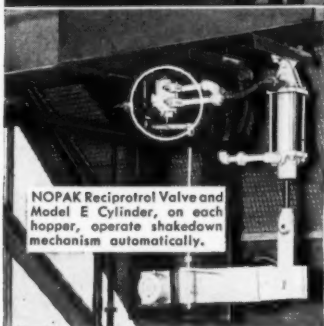
*get ready with CONE for tomorrow*

Allis Chalmers' new diesel tractor uses the hydraulic torque convert instead of the conventional transmission.





Battery of 18 Batching Hoppers in a large food processing plant.



NOPAK Reciprotrol Valve and Model E Cylinder, on each hopper, operate shakedown mechanism automatically.

## **AUTOMATIC "SHAKE-DOWN" for 18 Batching Hoppers is NOPAK Operated . . .**

This block-long battery of hoppers is used for measured mixing of product ingredients. Running thru each hopper is a rotating shaft, with paddles, connected to a NOPAK Model E Hydraulic Cylinder. As the cylinder reciprocates, the paddles shake down the dry ingredients which drop into glass-enclosed weighing batchers. Each of the 18 cylinders reciprocates 20 times per minute, 18 hours a day. This continuous reciprocating action is governed by 18 NOPAK Reciprotrol Valves. The entire mixing process is fully automatic . . . controlled from a central switchboard by 2 operators.

NOPAK Reciprotrol Valves can help you achieve automatic control of cylinder action in your plant, or in your product. Write for Illustrated Bulletin.

**GALLAND-HENNING MFG. CO., 2754 S. 31st Street, Milwaukee 7, Wis.**

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**VALVES AND CYLINDERS**  
**DESIGNED for AIR and HYDRAULIC SERVICE**

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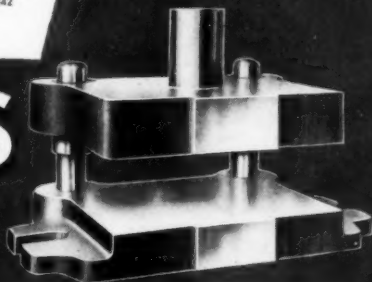
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When you order Die Sets you expect fine workmanship, high accuracy and dependable performance, of course...but in most cases fast service is equally imperative. And that, with Producto, is guaranteed. We offer you the convenience of hurry-up service from supply depots right in your Near Neighborhood. Check the Producto list in the arrow above. you'll find a supply source that points to you...for telephone, telegram, or in some instances, teletype ordering.

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3" thick SAE 1045, machined on  
Acme-Gridley 6 spindle chucker

## 45 SECONDS - MACHINED COMPLETE IN 13 OPERATIONS, ON AN ACME-GRIDLEY 12" CHUCKING AUTOMATIC

Heavy forgings finished at the rate of 80 an hour!

Where else could you get that kind of production except on a horizontal type automatic chucker—with its wide, open tooling zone and plenty of room for fast chip clearance?

The Acme-Gridley 12" RPA 6 spindle chucker offers all this, and more, too. It's built *rugged* (weight 70,000 lbs.)—for extra heavy cuts, fine accuracies and smooth finish. It's built for *easy operation, too*. To mention just one feature, the hydraulic loader holds heavy work

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And it's built for *speed*; makes wide use of independently-operated attachments. It will hog off chips as fast as modern carbide-tipped tools can take it. Simple, positive camming with quick job change-overs are additional operating economies to consider.

Can you use that kind of chucker performance?

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ASK FOR BOOK "How Money was Saved on 25 Chucking Jobs"—fully illustrated for sizes 10"—4 spindle, 8"—6 spindle and 6"—8 spindle Acme-Gridley Chuckers.

# The NATIONAL ACME CO.

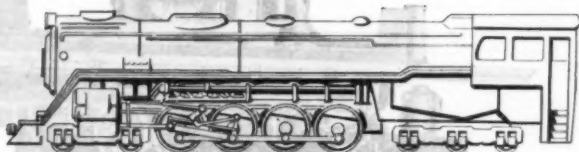
170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics:  
1-4-6 and 8 Spindle • Hydraulic Thread  
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**A LOCOMOTIVE**



**AND FAST TABLE TRAVEL**



CONTROL  
VALVE

**125 f. p. m. longitudinal table speed  
means fast micro-accuracy\* production  
with GRAND RAPIDS GRINDERS**



Fast longitudinal table travel — *the fastest available in any grinder* — is an important reason why you find Grand Rapids Grinders in so many leading plants. Such rapid operation makes possible high-speed, accurate production . . . of small mass-produced razor parts, as well as massive locomotive sub-assemblies.

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\*Accuracy within 0.00025 limits

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**Grand Rapids Grinders include: Hydraulic Feed  
Surface Grinders, Universal Cutter Grinders,  
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Combination Tap and Drill Grinders.**



**GRAND RAPIDS GRINDERS**

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# Get EASIER, FASTER, METAL MARKING



With one easy operation of the Pannier Supreme Holder, you can stamp a series of neat, legible figures or letters in hot or cold metal—save time and labor as compared with stamping just one character at a time.

This hand-style hammer is machined from high grade tool steel with no rivets or welded joints. Hardened anvil base in type slot holds 1/16" to 1/2" steel type in consistently perfect alignment. Tool steel striking head will not mushroom or spall—can be easily removed and replaced when worn, thus greatly increasing life of holder.

Supreme Holders are available in many styles, types and sizes to meet your needs. Write for details.

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Pannier, specialist in design, engineering and manufacture of *all* types of marking equipment, also offers Steel and Rubber Stamps, Type, Dies; Stencils; Embossing Equipment; Marking Inks; and Special Marking Machines for any marking need. Write for recommendations.

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Pittsburgh 12, Pa.

**PUSH**

TO

**START**

**PULL**

TO

**STOP**



**NEW MODEL 110**  
**DOUBLE SPINDLE HEAVY DUTY**  
**BUFFER and POLISHER**

One of the greatest  
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Combination Switch  
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spindle when switch is  
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Designed primarily for the polishing and burnishing trades. Model 110 eliminates cycle changing equipment and waste in power transmission. Also useful for numerous other purposes in industry. **TWO CHROME MANGANESE SPINDLES** mounted on heavy duty ball bearings driven by separate motors in base, operated together or separately.

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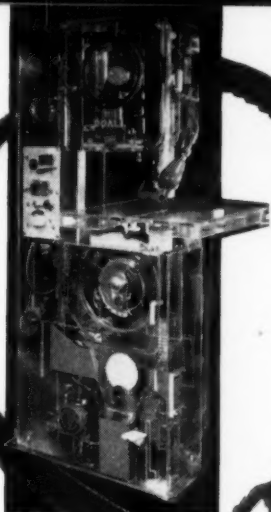
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CINCINNATI, OHIO

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Tin  
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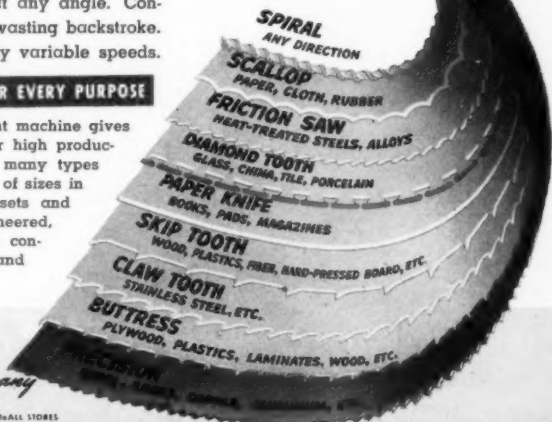
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with a  
**DoALL**

## WORLD'S FASTEST STOCK-REMOVING PROCESS

Used in all industries to speed up production and slash costs, DoALL Contour Machining starts where ordinary bandsawing stops. Cuts all materials including hardest alloys. "Slices" off stock in minutes—no slow "whittling" to shape. External, internal, straight or curved cuts at any angle. Continuous cutting—no time-wasting backstroke. Smooth power at infinitely variable speeds.

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IN 36 COUNTRIES

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IN KEY CITIES

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## NO. 51 AUTOMATIC CUT-OFF MACHINE



- ★ Completely Automatic
- ★ Fast Loading
- ★ Fast Cutting To Close Tolerances
- ★ Rugged Construction

The Bridgeport No. 51 Automatic Cut-Off Machine is a real money saver in any shop. It cuts fast and accurately, and produces polished and ground surfaces of such quality that costly secondary finishing operations are often eliminated.

Lengths from  $\frac{1}{4}$ " to 12" can be cut. One speed and stroke can be selected for cutting off single pieces, another for handling multiple pieces. The head assembly, actuated by a hydraulic cylinder, is mounted on a rocker shaft with sealed Timken bearings. The 18" abrasive cut-off wheel is driven through vee belts by a 10 HP motor.

Write for complete information on the new Bridgeport No. 51 Automatic Cut-Off Machine.

### SPECIFICATIONS

Capacity, in.	No. 47	No. 48	No. 49	No. 50	No. 51
Solids	1	2 $\frac{1}{2}$	2 $\frac{3}{4}$	Capacities on Application	2
Tubing and Light Sections	2	3 $\frac{1}{2}$	3 $\frac{1}{2}$		2 $\frac{1}{2}$
Motors, H.P.	3 or 5	7 $\frac{1}{2}$	10	10	10
Wheel Head Hydraulic	—	—	—	2	2
Size of wheel, in.					
Diameter	12	16	18	16 or 18	18
Thickness	up to $\frac{1}{8}$	up to $\frac{1}{8}$	up to $\frac{1}{8}$	up to $\frac{1}{8}$	up to $\frac{1}{8}$

## Bridgeport Grinders

BOX E . . . . STRATFORD CONN.  
BRIDGEPORT SAFETY EMERY WHEEL CO. INC., BRIDGEPORT, CONN.



*Any Size Hole*

*Any Shape Hole*

**—in any Steel or Metal including Carbides  
—with ELECTRO-ARC Boring Machines**

**That's what this Sensational  
Machine Will Do!**

● So new that the basic idea has been patented, Electro Arc Disintegrates broken Taps, Drills, End Mills, Reamers, Screws, Studs and the like—without heating or changing the temper of the metal.

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Let us show you—

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- How ANYONE can operate Electro Arc—
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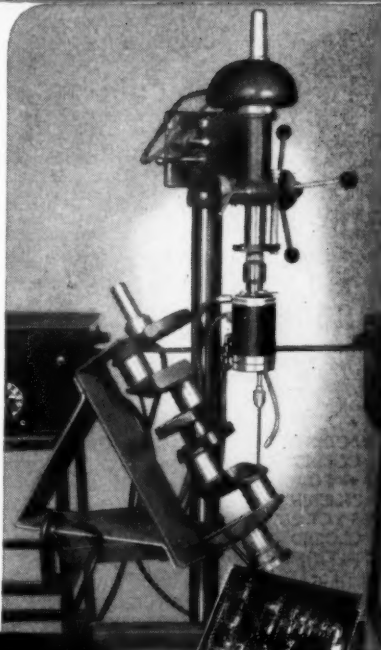
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**LET YOUR POWER "GO MODERN"  
FOR MAXIMUM EFFICIENCY AND ECONOMY . . .**

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**T**O coordinate power with the function of the machines . . . in a word, this is the primary purpose of Conway Clutches for practically any type of industry . . . and a significant factor in operating efficiency and economy.

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Illustrated is a P-25 disc clutch  
with dust cover.

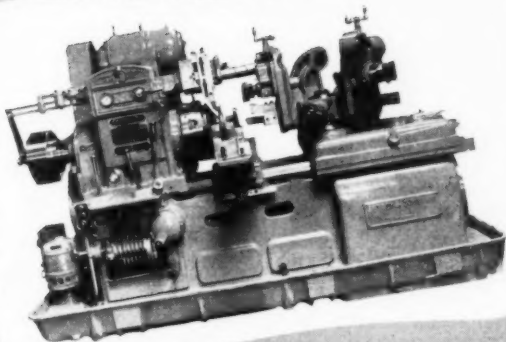
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Where power and rigidity are required in a turret lathe, more and more users are equipping their plants with the P & J 5-D Power Flex. Exceptionally well constructed, this automatic turret lathe provides long life with years of top quality production.

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Send today for complete information on how the P & J 5-D Power Flex automatic turret lathe can do a job for you today and in the years to come.

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**Potter & Johnston  
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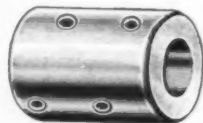
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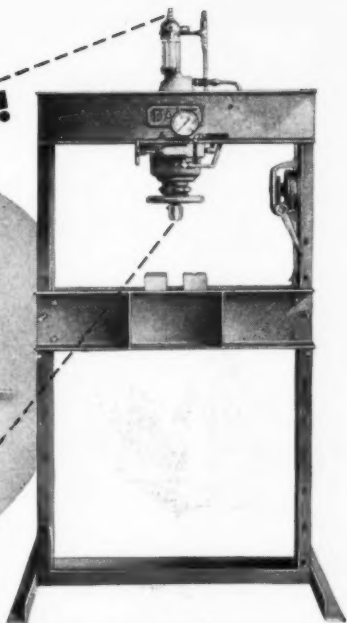
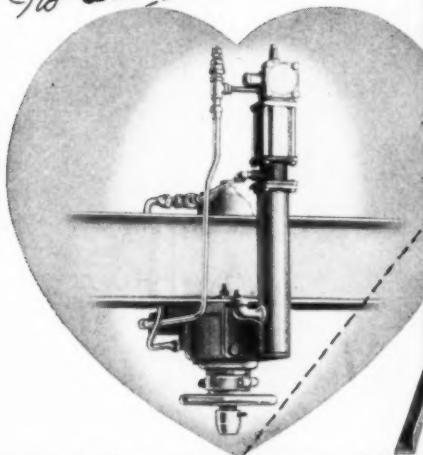
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**Chicago DIE CASTING MFG. COMPANY**  
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Please rush me details of your new air-operated presses.

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NEUTROL Magnetic Chuck Controls speedily release and demagnetize workpieces. With NEUTROL, there's no need to hammer or pry to release the work. This saves time and tempers—saves marred, distorted workpieces and prevents damaging of chuck faces. NEUTROL also protects chucks against harmful voltage surges.

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## ELECTRO-MATIC

**Industrial  
Rectifiers**

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## HEIM

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Roller Bearing Pillow  
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Heim also makes:  
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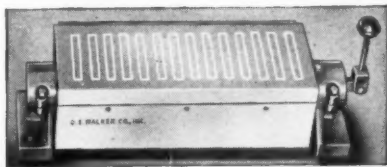
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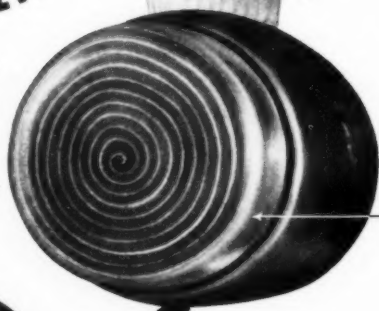
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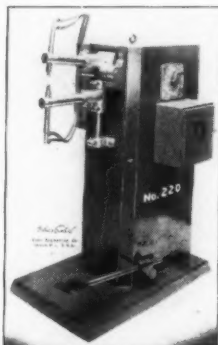
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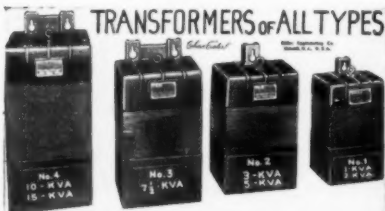


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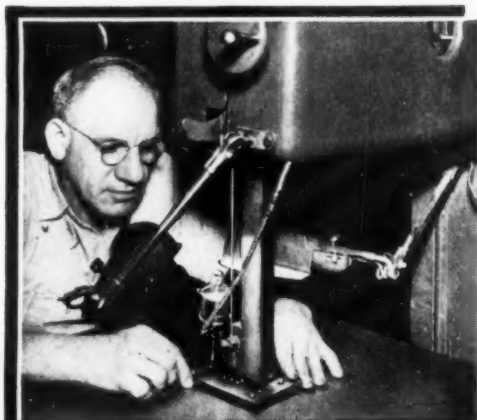
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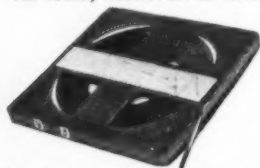
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*For Smoother*

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Atlantic's strong, practical box, plainly marked on sides and top. Remains in good condition until entire coil is used.

ATLANTIC'S special alloy steel insures longer wear and easier welding.

ATLANTIC'S one temper saw for all metals reduces stock you have to carry. Cut to length and welded, ready for use. Packed in strong Atlantic box. Write for new Atlantic Catalog.

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INCORPORATED

Exclusively Manufacturers of Band Saw Blades

153 Brewery St., New Haven, Conn.

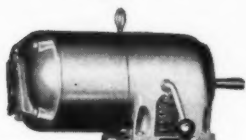
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Single phase units built  
in  $\frac{1}{2}$  and  $\frac{3}{4}$  hp sizes.  
Polyphase in sizes from  
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*Multi Speed GEARSHIFT DRIVES*

Available with or without integrally  
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123

# One of the 4 is EXACTLY RIGHT for your metal cutting...

## DISSTON BAND SAWS



Regular type for normal high speed cutting.



Reinforced type for heavy-duty, high speed cutting.



Buttress tooth pattern for speeds of 3,000 f.p.m. and over.



Regular type for normal low speed cutting.

No matter what metals you cut nor at what speeds you operate, Disston has the right band saw blade to speed up your work, reduce down time and cut costs.

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For high speed cutting of non-ferrous metals, plastics and many other materials. Two types (Regular and reinforced). Also recommended for friction cutting of ferrous metals at speeds of not less than 12,000 f.p.m. All sizes.

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Use these Disston Metal-Cutting Tools:  
FILES... HACK SAW BLADES... CIRCULAR SAWS... CARBOLOY FITTED CIRCULAR SAWS... TOOL BITS.

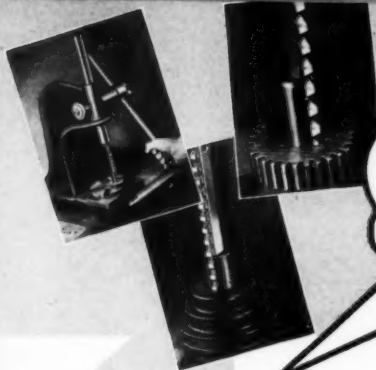


Order from your Disston Distributor,  
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MINUTE!**

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DO YOU LIKE  
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KIT OF  
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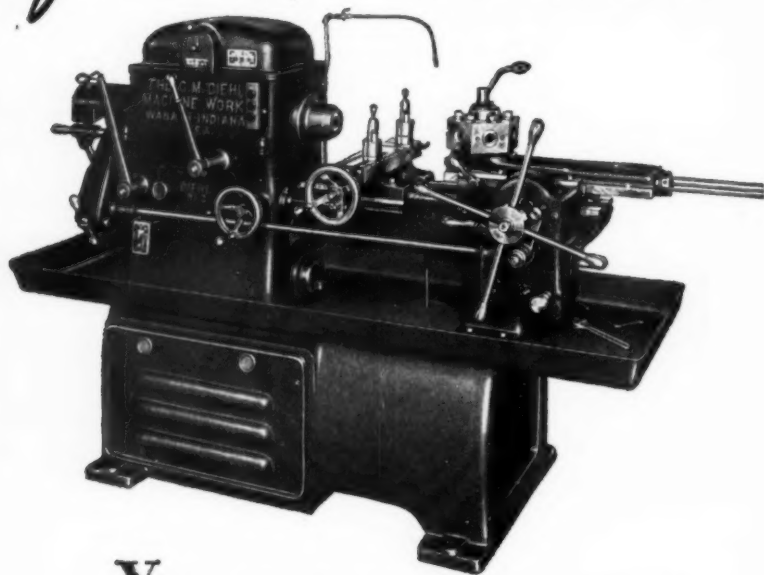
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**Y**OU can't beat Diehl for smooth accurate cutting to rigid specifications . . . just the lathe for those "production" jobs. In addition to its high speed precision performance, it works right alongside other No. 2 lathes of standard make—using same tooling, including collets. Write today for complete specification folder and details.

Automatic chuck capacity  
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Swing-over cross Slide.....6"

Swing-over Bed .....14"  
6 speeds.....forward and reverse  
6 feeds.....to turret slide

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# Featured in ... this issue ...

**CROSLEY MOTOR'S NEW COBRA ENGINE**, by H. E. Brazier. Crosley's new Cobra engine is a fly-weight of merely 59 lbs., and with all accessories, 159 lbs. The Crosley Car, powered by this engine, is capable of getting 50 miles to the gallon at a speed of 30 miles an hour, and 35 miles at a speed of 55 miles per hour. The motor is constructed of steel stampings, joined by copper hydrogen brazing. Maximum horsepower output is 26.5 at 5,200 rpm. The cylinder block assembly, the cylinder head, intake and exhaust port, valve cases and water jackets are made of light gage sheet steel, totaling 120 parts. Page .....133

**AN INDENTATION METHOD FOR MEASURING WEAR**. Investigations conducted at the National Bureau of Standards have disclosed a method for measuring wear through the use of narrow diamond shaped markings. These show a definite change in measurable dimensions and reflect relatively small amounts of wear. The marks are measured by means of a conventional microscope and eyepiece scale modified by the addition of two right angle prisms to produce a periscope effect for viewing the inside of the cylinders. Page. 141

**CAMS . . . THEIR PRODUCTION AND APPLICATION**, by John E. Hyler. The final article on cams touches on commercial equipment used for cam grinding. Builders of internal grinding machines have furnished a special grinder for grinding internal cams in quantity, and generally, a master cam is employed. The master cam is best produced by the manufacturer of the attachment or the machine, since this work necessitates extremely careful layout and procedure. Success in production cam grinding depends on proper selection of abrasive wheels, and this is best left up to grinding wheel manufacturers. Grinding of external peripheral cams is essentially cylindrical grinding. Page .....155

**LETTER FROM ENGLAND**. Page .....170

**HOW MUCH MONEY WILL YOU GET FROM YOUR SOCIAL SECURITY?** by C. M. Feeney. Lack of knowledge of securing Social Security benefits may cost potential recipients real money if they don't know how to go about filing claims. To most people, this is a nebulous matter. They expect to have that 1% taken out of their pay checks and they know they are entitled to benefits of some kind. But how much, how and when are questions to be put off until the future when time is a little more abundant. Page .....178

**THE EFFECT OF TAX POLICY ON THE MACHINE TOOL INDUSTRY**, by Tell Berna. The depreciation provision for retiring machine tool equipment and plant has long been a thorn in the side of business. The assumption that normal life of a machine tool is 15 to 25 years discourages operators from throwing out antiquated tools, due to the initial cost of the new manufacturing equipment and the loss to be taken on the machine tools which have become obsolete before their life expectancy on the books is up. Thus machinery is carried on books at inflated actual production efficiency value. Page .....189

**AVAILABLE LITERATURE**. Page ....203

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**INDEX TO ADVERTISERS**. Page .....350

# WHY USE AN ELEPHANT TO PULL A MILK WAGON



...and



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**SEES IT . . . . .**

### FREE ENGINEERING CONSULTATION SERVICE

All manufacturers now and again bump against vexing problems attendant upon a specific operation. The problem may be too unimportant for the expense of a specialized engineering consultant, and too complex for Joe, who's usually pretty clever. Usually props are used, as it were, to "make something do", while the basic problem is left hanging in the air much like Damocles' sword . . . a lilliputian sword, maybe, but nonetheless angry and pitiless.

To obtain competent advice, management would be wise to request the knowledge and experience of a manufacturer's sales engineer. The majority of machine tool builders and manufacturers of accessories are staffed by men who are not mere salesmen, but many of them are painstaking engineers; furthermore, they've been trained within an inch of their lives in the technicalities and the proper utilization of their respective products. If the problem concerns machining, who can better, more economically, unravel it, than representatives of the company who eat and sleep. And it won't cost a cent.

If a materials handling situation won't let you sleep nights, there are conveyor

experts, truck experts, pallet, chain, hoist and crane virtuosos and others whose paramount concern is how you pull, push, lift and stack your parts and materials.

If your punch press is producing below par, call in a die or a punch press technician; perhaps only an automatic die feed is needed, inexpensive and easy to install.

The average manufacturer is apprehensive lest he be sold a machine, a tool or a new fangled gadget. That reminds us of the chappie whose feet were blistered and beaten, but doggedly refused to see a doctor because it might be suggested he buy a new pair of shoes. On the other hand, if you call in a professional engineering consultant on a small problem he'll probably formulate the same solution as the manufacturer's sales engineer . . . and charge you a fee to boot.

An intelligent approach consists of obtaining the services of three or more different sales engineers, weigh and analyze their recommendations, act upon them and thus resolve the basic problem. It's not only intelligent, it's good business.

*William F. Schleicher*

Editor

## A BUYING GUIDE FOR ABRASIVES

### ABRASIVE PROBLEM:

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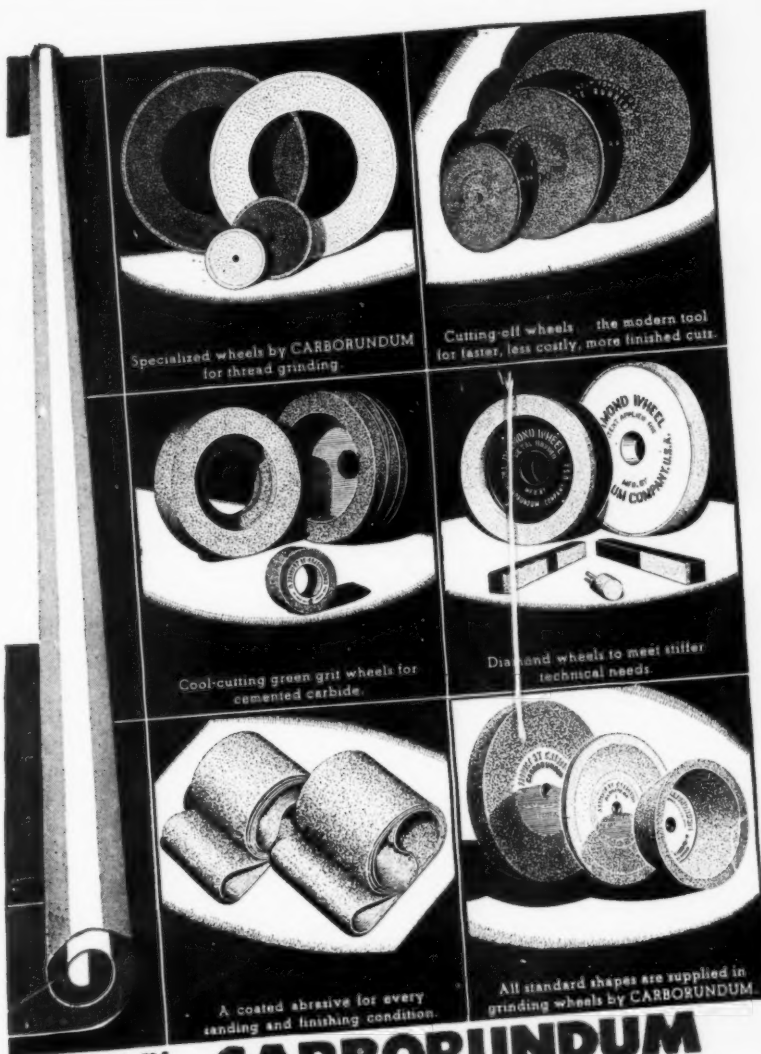
Key step between research and abrasive user, "Product Development" is an important activity at The Carborundum Company. Aimed at the development and application of the right abrasive in the right place, it brings about closer cooperation among abrasive machine builders, abrasive users, and our own research.

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# RYERSON STEEL



# Crosley Motor's New Cobra Engine

## IS MADE OF STEEL STAMPINGS, COPPER HYDROGEN BRAZED TOGETHER

By H. E. Brazier, Plant Manager, Engine Plant, Crosley Motors, Inc.



Powerhouse for Crosley cars are made of steel stampings, tubing, screw machine parts. They are copper hydrogen-brazed at 150 spots. A minimum of machining operations are used to mass produce the 1100-lb. cars at maximum efficiency.

ONE OF THE interesting features of Crosley's new 4 cylinder, valve-in-head Cobra engine is its weight, a mere 59 lbs., and with all accessories, 159 lbs. The cylinder block is constructed of steel stampings, steel cylinders, screw machine parts, all joined together by copper hydrogen brazing. The fan, generator pulley, fan pulley, and water pump impeller are also made from steel stampings, copper hydrogen brazed.

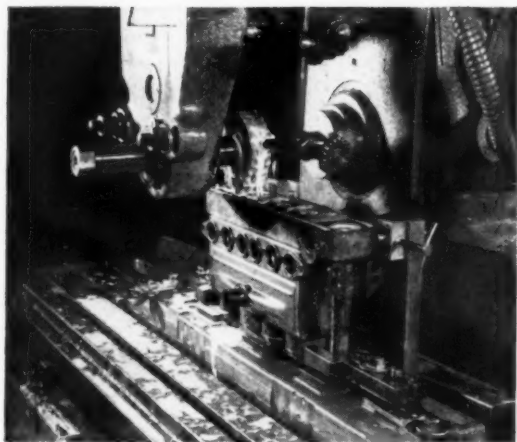
The maximum horsepower output is 26.5 at 5,200 rpm., developed at a displacement of only 44 cu. in., 2.5 in. bore by  $2\frac{1}{4}$  in. stroke and a compression ratio of 7.5 to 1.

The 120 parts which constitute the cylinder block assembly, the cylinder head, intake and exhaust port, valve cases and water jackets, are made of light gage sheet steel. Steel cylinder barrels are machined from chrome-molybdenum SAE 4140 which harden to 270 Brinell. The cam follower guides are also made from this alloy steel tubing. The rest of the engine block is manufactured from deep draw, low carbon sheet steel. The assembly is held together, prior to brazing, by crimping, rolling or spot welding. Valve seat inserts are of high carbon tungsten vanadium which harden



Fig. 1. The cylinder block is machined in this Pratt & Whitney surface grinder. Fixture holds 4 blocks at one time. Blocks are located by contacting to Nos. 1 and 4 cylinder barrels, which have been previously machined. The second location is taken from Nos. 1 and 4 valve guides and also Nos. 1 and 4 valve seats. About .032" of stock is removed. Limit is held from valve seat to bottom plate surface.

Fig. 2. Rough milling the cam bearing slot with a No. 3 Cincinnati using a multiple-tooth cutter. About .095" is removed from the 1½" wide slot. This slot aligns camshaft bearings on top of cylinder. The surface of slot is used for locating in subsequent operations.



to about 400 brinell. The majority of parts of the engine block are made from 20-gage SAE 1010 deep drawing steel.

The crankcase is a permanent mold aluminum alloy casting. It is only 3" high and weighs 7-3/4 lbs. All oil passages are drilled through this case. There are no external oil lines. All

main, connecting rod, crankshaft and camshaft bearings, a total of 16, are pressure lubricated.

The machining consists of a light cut off the bottom cylinder plate, the top camshaft bearings, and of boring and honing the cylinder walls and cam follower guides. Only ½ lbs. of metal is removed during this machining.



• • •

**Fig. 3. Rough boring of cam follower holes, tower shaft hole and valve guide holes. After bushing is pressed in place, a second machine bores the other four guides. A Schwartz fixture is being used on a Cincinnati Bickford with U. S. multiple spindle head. On this roughing operation  $1/32''$  of stock is removed.**

• • •

• • •

**Fig. 4. Rough boring cylinder hones which are held to  $.02''$  of finished honing size. A hydraulic fixture is used. Two holes are bored at once with this Ex-Cell-O; fixture automatically indexes to its original position. The size of the bore is  $2\frac{1}{2}''$ ; cylinders are  $3''$  apart. Carbide tipped boring bars are used.**

• • •





The crankcase and cylinder block are held together with studs which extend through the crankcase to the bearing caps.

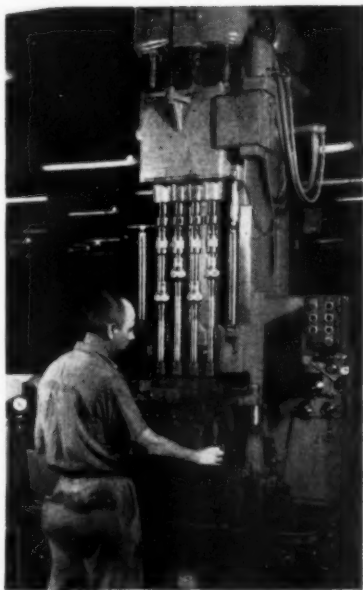
The overhead camshaft is drilled the full length for pressure lubrication of the five aluminum camshaft bearings. The cams actuate hardened and ground valve lifters, which are guided in alloys steel bushings in the cylinder block.

Copper, in the form of sheet, wire, or paste is applied to every joint and the assembly is then copper brazed in a specially constructed furnace at 2060 degrees in a neutral atmosphere. The furnace, which is 60 feet long, consists of a pre-heat chamber, where the cylinder block is gradually brought up to brazing temperature; the brazing chamber, where the temperature is maximum; and the cooling chamber.

At a certain point in the cooling chamber, where the block has been cooled from 2060 degrees to about 1500 degrees F., a cool neutral atmosphere is introduced into the furnace and allowed to circulate around the brazed assembly, which is thereby

Fig. 5. Finish bore 4 cam follower holes and the tower shaft holes. The next machine finishes bores the other 4 cam follower holes and tower shaft bushing. In between these operations, the tower shaft bushing is pressed into place.

Fig. 6. Finish honing operations on a Barnes 4-spindle hone equipped with Micromatic spindles. The honing operation is a completely automatic cycle. The finish on the cylinder walls is 16 to 20 RSM. The block is mounted on the fixture; all four cylinder holes are honed automatically.





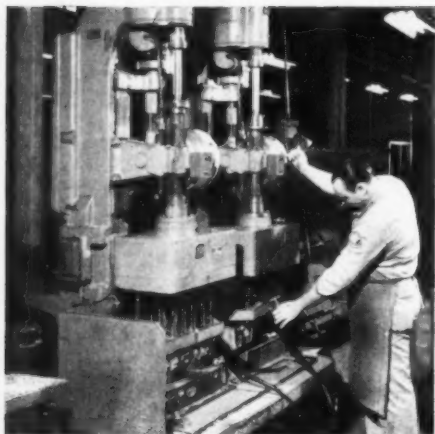
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**Fig. 7. Machining cylinder barrels on a Cone Automatic, 6-spindle, 59-second cycle. Operations are: turn, cut-off, face, chamfer. Carbides are used to machine these barrels made out of seamless steel tubing, SAE 4140.**  
 • • •

• • •  
**Fig. 8. Machining the bottom face crankcase casting, which is an aluminum alloy permanent mold casting, weighing approximately 7½ lbs. Note that the crankcase has 5 main bearings. Five main bearings are necessary due to the speed of the engine up to 6000 rpm.**  
 • • •



quickly cooled to about 1100 degrees F. The speed of this temperature drop determines the hardness of the cylinder walls, cam follower guides and intake and exhaust valve seat inserts which are made from alloy steel. The cylinder barrels harden to about 270 Brinell and

the valve seat inserts, which are made from a high carbon tungsten vanadium alloy, harden to about 400 Brinell. The warpage is held to about 1.64" by properly designing the stampings as to the height of extrusion, control of press fits and rate of pre-heat and cool-

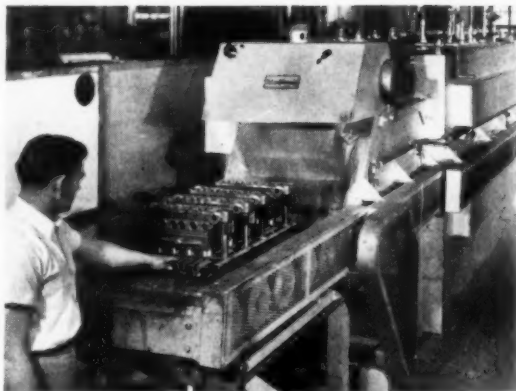


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**Fig. 9. Multiple drilling and reaming of all holes going through crankcase. Other holes are drilled in the sides on a similar machine: Motch & Merryweather with a U. S. multiple drillhead.**

• • •

**Fig. 10.** After final assembly blocks move into the brazing oven, all sheet metal parts are pressed, formed and stamped on brake presses and punch presses. Tubing, of which a portion of the assembly consists was bought and machined at the engine plant. Oven has three chambers: pre-heat, heating and cooling. Certain parts of the assembly are spot welded, crimped or rolled to hold them together until the brazing takes place.



ing in the brazing furnace.

The inside of the water jacket is coated with an inhibitor which prevents corrosion.

The material of the jacket is 20 gauge steel and the sides are ribbed in such a manner that nothing detrimental happens to the block after the water in it is frozen solid. This test was made in a cold room at 0 degrees F., along with

a hand cranking check which proved that the aluminum crankcase does not shrink enough to cause a noticeable drag on the bearings.

The mileage for the new Crosley Car which this engine is now powering is 50 miles per gallon at a speed of 30 miles per hour, decreasing to 35 miles at a speed of 55 miles per hour. **THE END.**



## Winning Combination

"HANDS" by Robert Comport is a prize-winning photographic study selected for excellence of detail. A stickler for accuracy, Mr. Comport chose as his model a craftsman whose sensitive hands reflect years of painstaking labor on precision work. And to complete the picture, he chose Starrett Tools—the tools skilled craftsmen use. Shown in the photographic study are: Starrett Micrometer No. 230 and Starrett Telescoping Gage No. 229.

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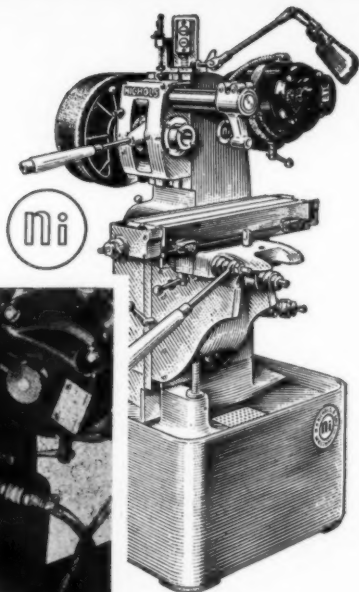
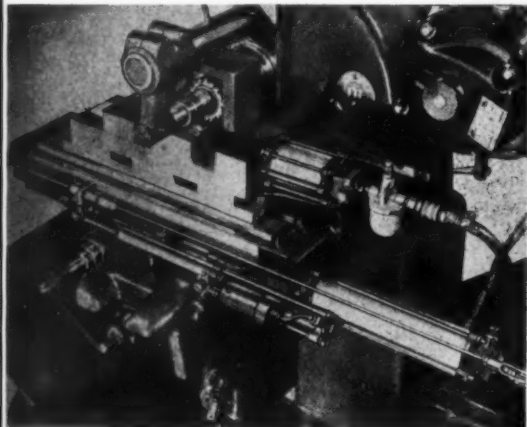


Photo shows Nichols power feed attachment installed. In this case, work is held in an air-operated vise



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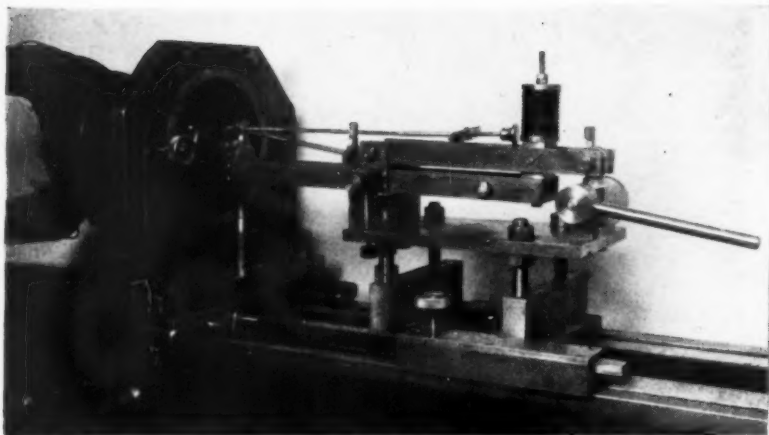
## AN INDENTATION METHOD *for Measuring Wear*



**New method measures wear of machined surfaces by making a small mark on the surfaces of parts. As little as one hundred thousandth of an inch is measured under favorable conditions.**

ONE OF THE major difficulties in the determination of the wear of machinery surfaces has been the lack of a convenient method for accurately measuring the amount of material worn off. Among the methods that have been widely used are weighing and measuring the dimensions of parts before and after wear, and determination of the amount of worn material found in the lubricant after operation. Even under ideal conditions these methods have serious limitations. Such limitations, coupled with the fact that the methods often measure other conditions along with wear, indicated the desirability of a method of measuring wear that is independent of the size or mass of the wearing piece.

Investigations conducted at the National Bureau of Standards under S. A. McKee led to the adaptation of a diamond indentation method of measuring wear. As a result, a sensitive measuring instrument, the McKee Wear Gage, was developed to measure extremely small increments of wear, as little as one hundred-thousandth of an inch under favorable conditions. By applying to the working surfaces narrow diamond-shaped markings that show a definite change in one or more readily measurable dimensions after



**Fig. 1. An aircraft cylinder is mounted in a special fixture with the gage in position to make a mark on the cylinder surface. The indentation, applied to any desired position on the surface, is of such shape that a relatively small amount of wear will make a definite change in one or more measureable dimensions of the mark. This provides a very accurate indication of wear at the point of the mark.**

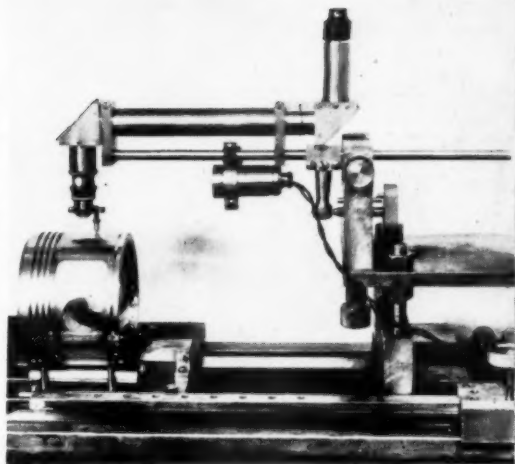
relatively small amounts of wear, the gage provides a determinable indication of wear at the point where the marking is made.

Extensive tests at the Bureau have provided conclusive evidence that the indentation method of determining wear overcomes the shortcomings of other methods. For example, the weighing method gives a value for the total wear but does not indicate where the wear occurred. Measuring the changes in the dimensions of a worn piece has this same limitation to a lesser degree and does not differentiate between actual wear and other changes that may occur such as growth, shrinkage, or distortion of the part. The method of determining the amount of worn material in the lubricant presents a number of difficulties and usually is used only as a qualitative indication in conjunction with other data.

The McKee gage was designed primarily to locate and measure indentation marks on the cylinder walls and pistons of radial aircraft engines, (Fig. 1) since permanent distortion of such parts during operation had heretofore nullified the significance of any previous methods of measurement. The choice of the type of mark was influenced by an earlier development at the National Bureau of Standards—the Knoop Indenter for measuring the hardness of materials.

Special apparatus was developed for making and measuring the marks placed on the wearing surfaces by the diamond indenter of the wear gage. (Fig. 2). With a cylinder or piston mounted in a specially designed fixture, marks are applied at any desired position on the surface by means of the diamond point, which is forced by me-

Fig. 2. The viewing and measuring apparatus used in conjunction with the McKee wear gage consists of a microscope and eye-piece scale modified to be used as a periscope for viewing the inside of a cylinder. In this set up the apparatus is being used to view and measure the changes in dimension of a mark placed on a piston surface in order to determine the amount of wear.



chanical pressure to a predetermined depth into the surface piece. The viewing and measuring apparatus consists of a conventional microscope and eye-piece scale, modified by the addition of two right angle prisms so that it may be used as a periscope for viewing the inside of the cylinders.

The impression of the marks in the surface of the metal raises a burr around the mark. The shape of the diamond indenter is such, however, that the major portion of the burr is formed on the sides of the mark. Though no burr is visible to the eye at the ends of the marks, the presence of a very slight elevation of the surface may account for the minor deviations from a straight line shown by calibration curves. In the course of the investigation it was found that most of the burr could be easily removed by rubbing lightly with fine polishing paper. For use with the cylinders, a sheet-metal guard similar to the usual erasing shield but of larger dimensions

was found convenient. The holes in this guard are so arranged that the polishing paper can be rubbed over a small area at each mark on the cylinder wall with one finger.

As the marks are placed with their long axes perpendicular to the axis of the cylinder, the relation between the change in depth of mark to change in length of long axis is affected by the curvature of the cylinder. While this effect is relatively small for the particular cylinders used, suitable corrections for curvature provide greater accuracy in determining wear.

A study was also made of the possibility of error due to the axis of the diamond indenter not being at right angles to the surface when the indentation is made. Computations indicated that if the diamond-shaped mark was symmetrical to within a ratio of not less than 41 to 50 along its major axis, the error would be no greater than one percent (approximately 0.00001 in.) It was found that the apparatus could be

adjusted to produce a symmetrical mark and that other marks, either in the same cylinder or in other cylinders of the same nominal size, could be made well within the limits of symmetry without further adjustment. Accordingly, corrections for lack of symmetry were not necessary.

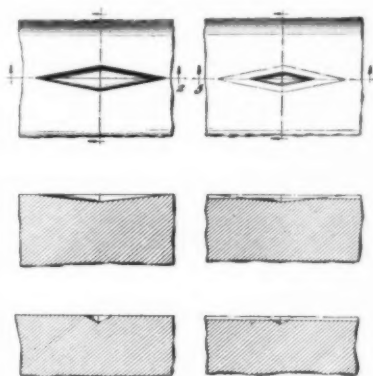
One of the important considerations in the bureau's investigation was uncertainty as to whether the marks would return to their shape during operation of the engine. Results of a number of engine tests have shown that marks in the cylinders of radial aircraft engines retain their shapes sufficiently to provide reasonably accurate wear measurements. Experience has indicated that results are not as satisfactory after the marks have been worn to about one-fourth of their original length or less. Hence, greater accuracy may be obtained by carefully regulating the size of the mark and adjusting the duration of the test to prevent this condition.

The precision of the wear measurements depends upon the condition of the indentation. With new marks the points are sharp and the lengths can be accurately determined. However, after the engine has been operated the marks are somewhat blunted and it is

necessary to estimate the position of the point. (Fig. 3 and 4). Under normal conditions the cylinder wear can be determined with an overall accuracy of plus or minus 0.00004 inch. For more favorable conditions the degree of accuracy can be increased to plus or minus 0.00002 inch. Operating experience with marks in the pistons indicates that, with the softer aluminum alloy, the marks have a much greater tendency to distort and the results are not entirely satisfactory. Another difficulty with this material is its tendency to become impregnated with carbon making it difficult to distinguish the marks.

Most of the engine tests for determining the performance of the marks in service were made with Pratt and Whitney R-1535 engines having chrome-molybdenum steel cylinder barrels 5-3/16 inches in diameter. In these tests 24 marks were made in each cylinder, 6 spaced 60° apart at each of 4 levels—approximately 2, 4, 6 and 8 inches from the open skirt end of the cylinder. The upper row of marks was in contact with the top ring only while the lower was contacted by the oil ring.

Fig. 3. Enlarged diagrams of a typical indentation made by the McKee wear gage. Views on the left (top to bottom) are the plan, longitudinal, and transverse sections of a mark before wear occurred, while those on the right are the same mark after material has been worn from the surface. Note that shape of mark remains the same, but the length decreases in proportion to the thickness of material removed. For the diamond used, the ratio of depth of mark to length of long axis is about 1 to 35, that is, a mark about .001 inch deep has a long axis of about .035 inch.



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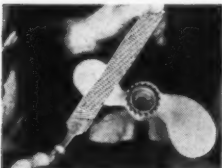
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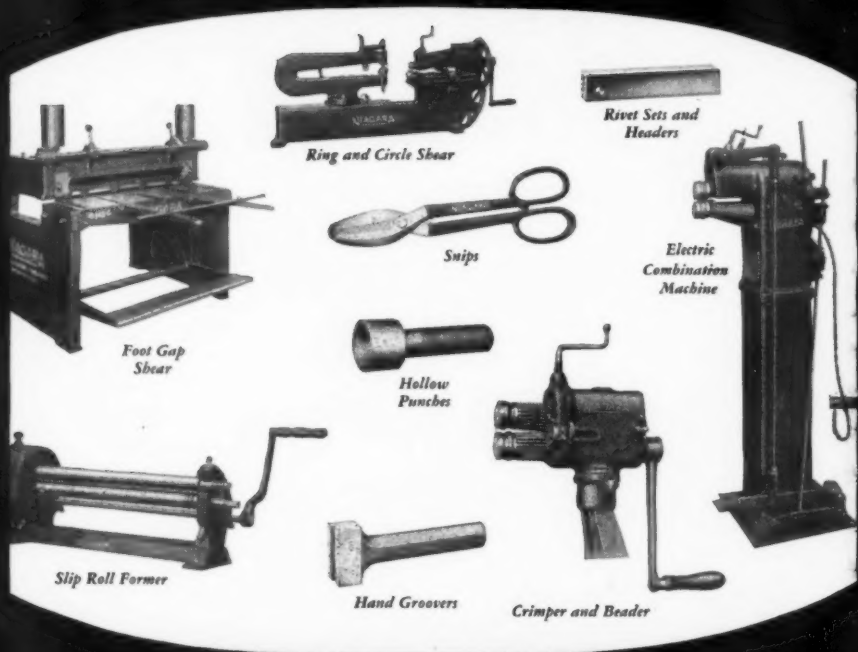
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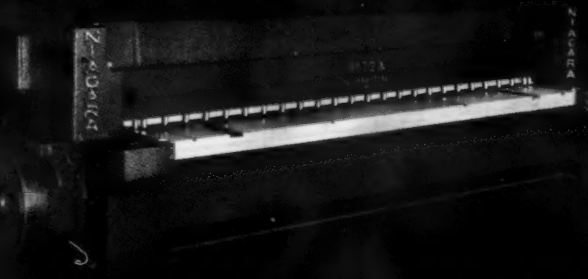


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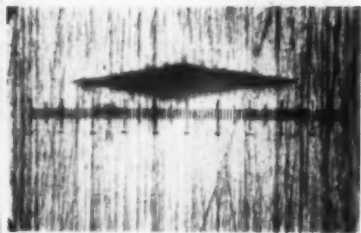
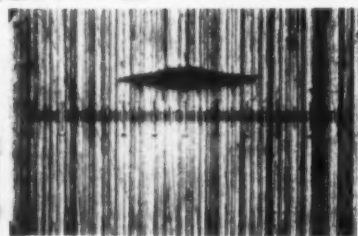
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Employing the basic principles of the original McKee gage, an instrument was designed by the American Instrument Company for use with automobile engines in which the cylinders are cast into a single engine block. This instrument, used in an extensive series of tests by C. S. Bruce, J. T. Duck, and A. R. Pierce of the Bureau's Automotive Section, permitted accurate studies of

Fig. 4. Two typical marks used for determining extremely small increments of cylinder wear after engine operation. These marks were originally about .9 millimeters long. The scales shown represent an actual length of 1 millimeter (.0394 in.) but when observed in the viewing apparatus are  $2\frac{1}{2}$  inches long.



For the diamond used and chromo-molybdenum steel cylinders the total length of the scale represents about .0012 inch in depth; hence one of the small scale divisions is equivalent to slightly more than .0001 inch of wear. This gives an idea as to the order of sensitivity of the method.

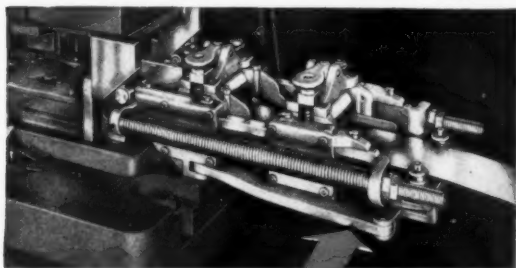
the effects of wear in stock passenger-car engines operated under controlled conditions. The test engines were operated for 144 hours (approximately 3000 miles of normal operation) between wear measurements, the operating cycle consisting of 20 minutes of actual operation with a 10-minute stop for cooling. During the stop period a special cooling system reduced the temperature so that the engine was started from a cold condition at the beginning of each half-hour period. (Fig. 5.)

Results of these tests, in which the average cylinder wear was about 0.00002 inch per 1000 miles of operation, verify a previously accepted theory that operating conditions have a decided effect on cylinder wear, there being in general a greater amount of wear when starting the engine at low temperature than at high temperature ( $50^{\circ}\text{C}$ ). The data provided by such sensitive determinations of wear also indicated the possibility that corrosion is responsible for a major part of the wear occurring in normal operation of an engine. It is believed that moisture condensing on cold cylinder walls serves as a base for the formation of corrosive acids from the gases in the products of combustion. It appears that engine life may be substantially increased by any feature of design that accelerates the engine warmup or prevents the temperature of the cylinder walls from falling below the dewpoint of the exhaust gases. Additional data on the corrosive qualities of fuels would be desirable.

The indentations used in the studies at the Bureau were made by impressing into the test surface the apex of a four-sided diamond pyramid. From the standpoint of accuracy the chief limitation is that the sharp points of the marks are blunted somewhat when wear occurs. Possible use of cutting or grinding methods for producing marks



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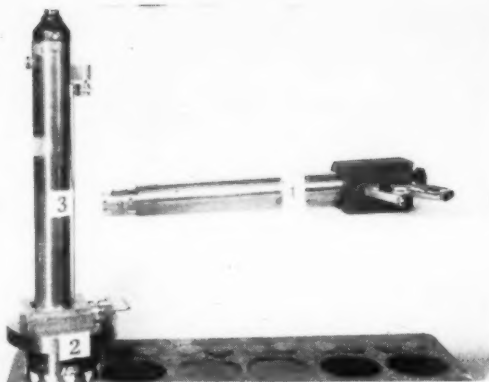
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Fig. 5. The wear gage as designed for use with automobile engines in which the cylinders are cast into a single engine block. The three components of the instrument are: 1. Indenting tool, 2. Indentation locator, and 3. Microscope.



without burrs and without sharp-pointed ends presents a promising field for further investigation. If this can be accomplished, the accuracy of determining wear would be greatly increased.

The McKee wear gage provides the particular advantage of an indication of wear only, while the usual measurements of changes in diameters of the pistons and cylinders do not differentiate between wear and distortion that may occur during a test. It also indicates wear at a particular point on the surface, whereas measurements of diameter involve changes at two points and practical means are not generally available for determining the amount of wear at each point. Also, the

method does not require the careful technique necessary to measure diameters with corresponding accuracy.

As temperature variations do not materially affect the accuracy with the indentation method, it is not necessary to bring the cylinder to a definite temperature before making the measurements. The apparatus is provided with locating pins and is so arranged that a mark made at given pin settings will fall within the field of vision of the periscope at the same settings. This eliminates loss of time in searching for the marks which are too small to be readily discernible to the eye.

In addition to its use as a practical method of measurement of wear in

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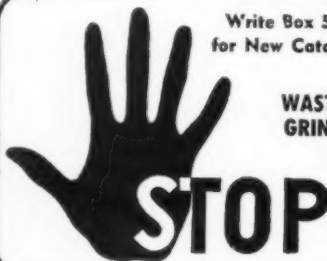
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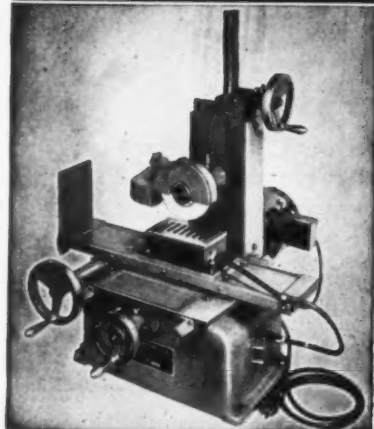
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aircraft and automotive engine cylinders, the indentation principle appears applicable to other machine elements, gages, dies, and wearing surfaces where the material is of such a nature that the indented marks will retain their shape in service. For example, a mark placed on the wearing surface of certain production dies would readily indicate when it had been worn beyond specified tolerances.

(Developed at the National Bureau of Standards by S. A. McKee at the suggestion of and with collaboration of Dr. H. C. Dickinson. The method is covered by U. S. Patent No. 2, 233, 403, granted to Dickinson and McKee and assigned by them to the United States Government.)

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Mr. Cooper, in whose memory the scholarships are being established, was a graduate of Yale in 1892. He served as Fafnir's first General Manager, was President of the company for some time and at his death last January was completing his 20th year as Chairman of the Board.

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**2** The speed at which the file or bur can be driven depends to a great extent on its diameter. The smaller it is, the faster the speed. (We will be glad to meet your request for charts of approximate speeds of high-speed steel Rotary files and Ground Burs and Carbide Ground Burs for general applications.)

**3** Be sure to use sharp files or burs. Never overlook the fact that the operator's time is the big cost item, and that he needs well-sharpened tools. (Nicholson provides an excellent sharpening service for burs and a conversion service for making burs from worn Rotary files.)

**4** Use a short grip on the shank for accurate control, and a longer grip for reaching out-of-the-way places. Although the standard length shanks will do the majority of jobs, other lengths can be secured for special cases.

**5** Normally, medium cut files and burs will give sufficient stock removal and acceptable finish to meet most needs. However, if heavier cutting or stock removal is required, coarse cut should be used; and correspondingly, the fine cut should be selected if a very smooth finish is required.

**6** Excessive pressure shortens bur life and does not materially add to stock removal. Use a firm pressure and allow the tool to do the cutting.

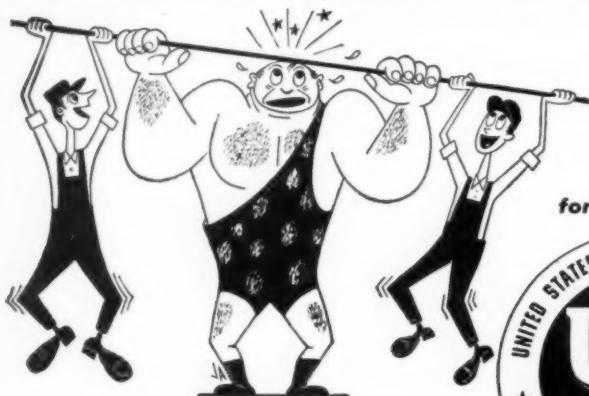
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# UNITED STATES STEEL

# Cams . . . . .

## THEIR PRODUCTION AND APPLICATION

by John E. Hyler

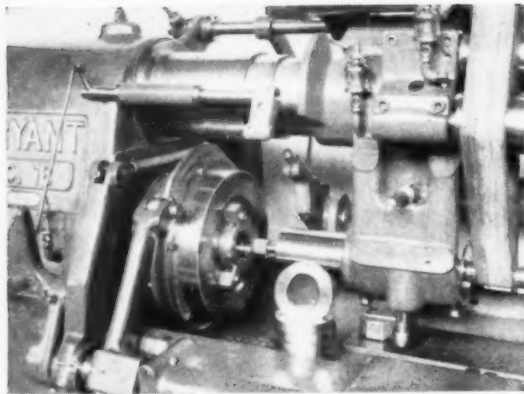


The fifth and final installment of a five part series on cams and their applications. Previous installments appeared in the January, February, March and April issues.

Cam grinding requires careful selection of grinding wheels whether grinding internal or external cams. Special attachments are used whenever their application is warranted. Exceedingly careful layout and procedure is necessary in making master cams. Where single cams are mounted on very short camshafts, they may be chucked for grinding.

**W**e are aware that some methods employed for milling cams have left untouched. We are also aware that cylindrical cams have often been machined in an engine lathe, using special equipment. We realize that a number of other interesting things concerning cam production have not been covered, but in this final article, we must turn our full attention to cam grinding. Even in our consideration of cam grinding, we cannot deal with all phases of it, particularly. It is known for instance, that some individual shops have devised and built attachments for their own use, in grinding cams at a surface grinder. But such attachments are found only now and then. They do not rank in importance with commercial equipment used for different types of cam grinding.

In many instances, where grinding of internal cams in considerable quantity is involved, builders of internal grinding machines have furnished a special grinder adapted for the work. Arrangements of this kind take the form of a specially-built internal grinder, and not the application of a cam grinding attachment as such, though such layouts have sometimes been rather loosely referred to as cam-grinding attach-



Shown here is a Bryant No. 16 internal grinder, specially arranged and fitted for grinding internal cams. The hole in one of the ground work pieces is shown in the foreground. You will observe that a master cam surrounds the chuck, to actuate a rocker-shaft follower. Action is derived from this rocker shaft to actuate the internal grinding spindle transversely. Wheel drive and traverse are standard. Size is controlled through the standard cross feed-screw. This machine is the old type, with the overhead slide bar for the wheelhead.

ments. The machine must be specially developed and built for the purpose at the factory, though it retains the basic characteristics in large part, of a standard internal grinder.

The fact is that external cams of relatively small size, when they are to be produced in quantity, can also be ground on a machine of this general type. Some of the illustrations included with this article show such specially-developed internal grinders. This is probably the best method available for producing internal cams of small and moderate sizes in volume. It will be observed, in the illustrations mentioned, that the grinding of cams on these machines is really a copying process. The same thing is essentially true in practically all cam grinding, a master cam being employed in most instances.

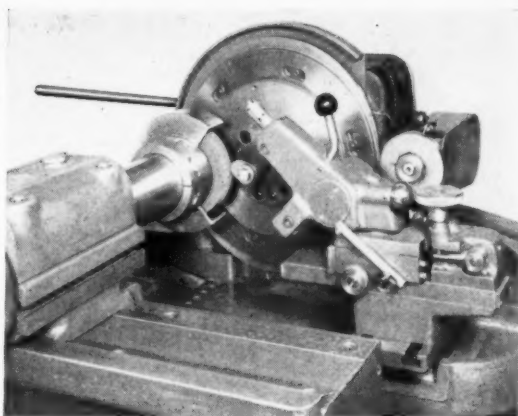
Some cams, particularly in the automotive field, are of hardened steel while others are of cast alloys. It is evident that success in production cam grinding will depend in no small degree on the selection of abrasive wheels best suited to the work. Too hard a wheel will cut too slowly to obtain the best

production record consistently, and in addition to that, it may burn, or cause chatter marks on the work, or both. One without previous production experience in cam grinding cannot do better than consult with grinding wheel manufacturers on this point for a start, at least, for their wide experience enable them to give very good recommendations along this line. All of the job conditions should be cited, as far as possible, when seeking such preliminary information. However, it is to be remembered that actual wheel tests on the particular job being performed in order that productive comparisons may be made, will bring one still closer to ideal practice. Obviously, any wheel which produces chatter marks on the work, when other conditions are known to be right, cannot be tolerated in use.

In speaking of other conditions being right, however, we are faced with a considerable array of factors, for there are various things that can cause chatter marks on cams being ground, aside from a wheel that is too hard. If the brake is not adjusted properly on some types of cam grinding attachments, for instance, chatter marks will result. The



Here is seen a Bryant No. 112 grinder specially fitted and arranged for grinding external cams, one of which can be seen in process of grinding. Here, again, a master cam is mounted on the chuck, and bears against a roller to provide transverse movement to the workhead. The workhead (as can be seen in another illustration), is carried on an auxiliary transverse slide, thus allowing the work to be advanced toward and retracted from the wheel. The truing diamond is mounted on the standard workhead mount. The size is controlled by the standard feedscrew.



same thing sometimes comes from simple vibration. In fact, more chatter marks result from this cause than from any other. The machine itself must be of good rigid construction, and one must be certain that there is no vibration of the machine setting. If there is, it may be necessary to provide the machine with a special foundation. In other instances, the unit may be moved to a section of the plant that is vibration free.

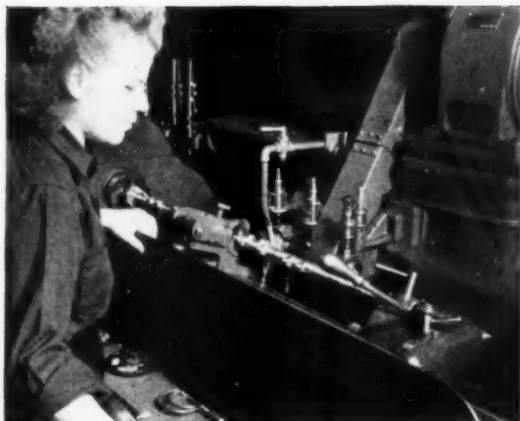
Work that is integral with a cam-shaft, and is therefore ground between centers, may develop chatter marks if the centers are out of true, or if their lubrication is faulty. Chatter marks on cams have also been traced to different factors having to do with improper or untrue wheel rotation, as for instance a wheel, motor and spindle assembly being out of running balance, wheel spindle bearings being loose, or the spindle itself being slightly sprung. One thing that adversely affects the proper running of a wheel is the use of metal belt lacing on a spindle drive. This should never be tolerated where cams are being ground.

It may quite accurately be said that grinding of external peripheral cams, whether as single cams or on a cam shaft, is basically cylindrical grinding. There is the difference, however, that the work, as it revolves, is made to approach and retreat from the wheel in exactly the required amounts, and at exactly the proper rate, to generate the periphery of the desired cam against the in-feeding abrasive wheel. It follows that all of the precautions necessary in high precision cylindrical grinding are also necessary in accurate cam grinding, plus those which stem from the necessity for advancing and retracting the work under close control, in the manner cited. Cam grinding attachments are available for application to standard cylindrical grinders, and are much used. In some instances, attachments for such use are designed with reference to production of some specific type of cam. An instance in point is a distributor cam grinding attachment which grinds these cams at the rate of 4 or 5 per minute. One operator can run two machines fitted with such attachments, thereby grind-

• • •

Here is a close-up of a Norton Cam-O-Matic grinding a camshaft for the Rolls-Royce Merlin motor. This particular shaft has cams with re-entrant curves (that is, concave curves) and for that reason, a small-diameter grinding wheel (having a radius less than the shortest radius of the re-entrant curve) must be used.

• • •

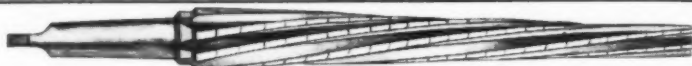


ing 8 to 10 cams per operator-minute. The cams may be removed from the attachment by an automatic ejector, which is tied in with the abrasive wheel feed cycle.

In producing a cam profile by grinding, the arrangement nearly always contemplates holding the work in a pivoted cradle or other rocker-type arrangement, and swinging that cradle toward and from the abrasive wheel by means of a master cam, mounted in axial alignment with the work, and bearing against a roller as it revolves. The master cam, bearing against the roller, causes the work cradle to swing,

thereby automatically providing the necessary advancing and retracting motions to generate the cam profile against the in-feeding wheel. Obviously, exceedingly careful layout and procedure is necessary in making the master cam.

It is really better, due to the great care which must be employed, to have the master cam for producing any specific cam profile, on a given machine made by the manufacturer of the attachment or the machine. Such manufacturers naturally have duplicate machines in their own shops. Thus, master cams made by them can actually be



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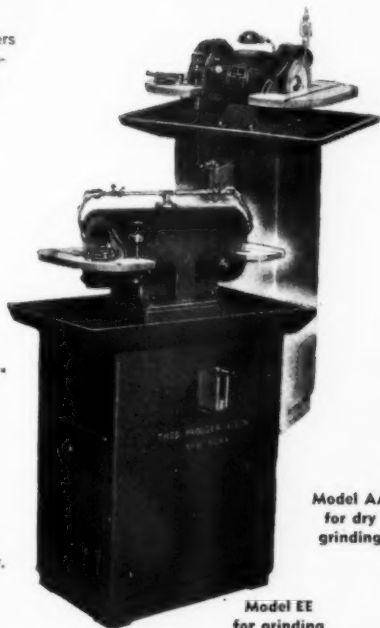
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tried out, to prove that exactly the correct cam profile is produced, before those master cams are sent on to the user. The first step in making a master cam is to produce a model cam, many times oversize. In some instances, the layout of a model cam is as much as twenty times oversize. By making it greatly oversize, accuracy of a higher degree is obtained. This is very important, since any errors in the model cam will inevitably be carried on into the work. The model cam is then employed in making the master cam, using a special cam generating machine for the purpose.

In making the model cam, some makers compute the radii and lift for each degree of rotation. One manufacturer of cam grinding equipment, in checking model cam contours, employs a delicately adjusted laboratory testing machine which uses a Zeiss measuring instrument, allowing readings of the lift or rise to be made to .00005"

for each degree of rotation, the angular setting being accurate within one minute. Once the master cam for grinding a given standard cam is on hand, it is wise to mark it plainly, preferably with an electric etcher, so the cam grinding machine operator will know at once which is the master for any given cam outline he wishes to grind. This is especially true, of course, in plants having many types of standard cams to grind.

Light attachments have quite often been applied to universal tool and cutter grinders, for grinding small cams. Where single cams are mounted on very short camshafts, they may be chucked for grinding. Loose cams can be and often are mounted on arbors or holding fixtures for grinding, thus eliminating the need for holding the work between centers. Any cams mounted upon or made integral with a shaft can be held between centers for grinding. Where the shaft has very



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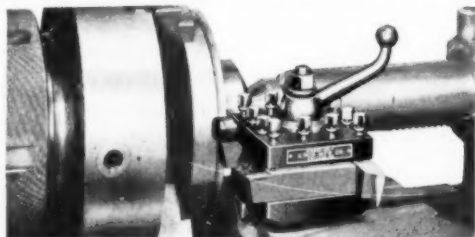
great length, it is necessary to hold it between centers. Automotive camshafts are of necessity held in this manner. Special work rests are also employed for use in connection with long camshafts, to support the shaft, and thus to prevent any springing and chattering, under the working thrust of the grinding wheel.

There are many different arrangements of machines and attachments for grinding cams on automotive camshafts. This type of cam grinding is no small part of the overall industrial aspect of cam production. There are different things that enter as factors in intelligent selection of equipment to be used for the purpose. The fact is that builders of such equipment may well be consulted, before a final decision is made. Finish requirements differ, depending on whether the shafts go into low-priced, medium or high-priced cars. Production requirements on a given camshaft have much to do with

it. In some instances, standard cam grinders are employed, over long periods of time, grinding only one type of camshaft. In others, several different camshafts may be ground on the same machine or equipment. Tolerances, as regarding accuracy, may be more strict in some cases than others, and this inevitably affects an intelligent selection of equipment.

Where camshafts of automotive and similar types are ground, angular relationships or timing as between the different cams on the same shaft will assume great importance. In order that these and other relationships as between the different cams may be closely held, without undue loss of time, the various master cams employed for generating the different cams on the shaft are hardened and then keyed on one large diameter spindle. This spindle is arranged in line with the cam shaft on which the cams are being ground. In fact, this assembly is often referred

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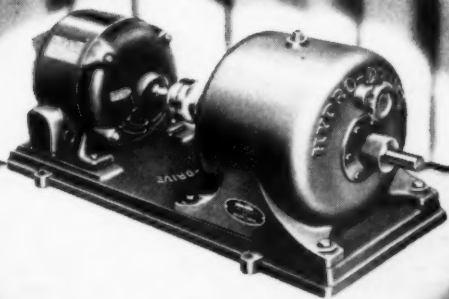
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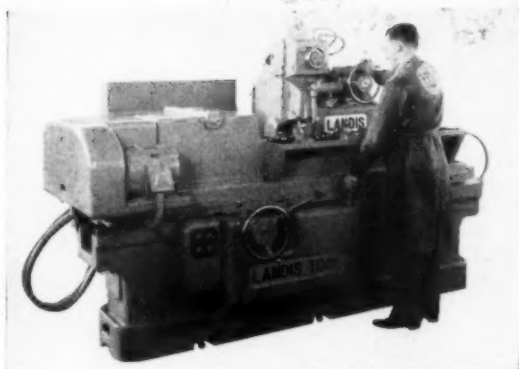
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Front view of the Landis hydraulic cam grinder in operation. By looking close, the camshaft being ground can be seen in the work cradle.



to simply as "the master cam," regardless of its composite nature. One end of the spindle is arranged to receive a center, axially, thereby insuring that the camshaft will have a common axis with the master cam spindle while the grinding is in process.

The center at the other end is held in a footstock. To insure perfectly true-running center points, one manufacturer of cam grinders provides a motor-driven center grinding attachment. This attachment can be clamped to the rocking bar, which carries the master cam spindle and the footstock. It has provision for traversing the center grinding wheel with a hand operated lever. Thus, the master cam spindle center can be ground true while

it is revolving in place. The footstock center is the same size as the master cam spindle center, and can therefore be inserted in the master cam spindle, for grinding with the same attachment. It is best, of course, to grind the footstock center first, under these conditions, for then the center which is to be used in the master cam spindle will not be moved after grinding, and will be absolutely perfect, with regard to rotational truth of its point.

Cam grinding machines of the type suited for processing automotive camshafts are made by different companies, and in different sizes. One very fine line of hydraulic cam grinders includes machines made in six different sizes, when both the length of the

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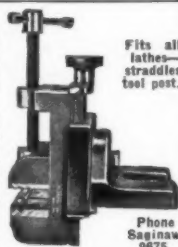
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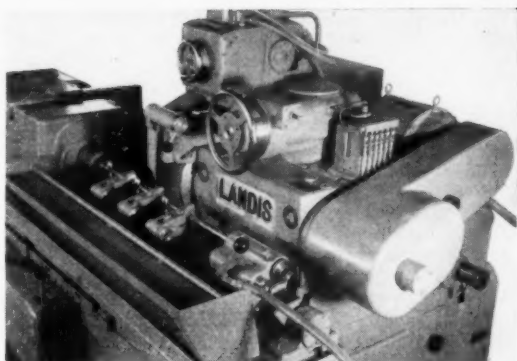


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Top view of a Landis hydraulic cam grinder, looking from the righthand end of the work cradle. Here, the camshaft, the centers between which it is held, and the three intermediate work rests may be clearly seen. These work rests may be securely clamped to the cradle at any desired position, and prevent any deflection in the camshaft as the working thrust of the abrasive wheel comes against each revolving cam in turn.

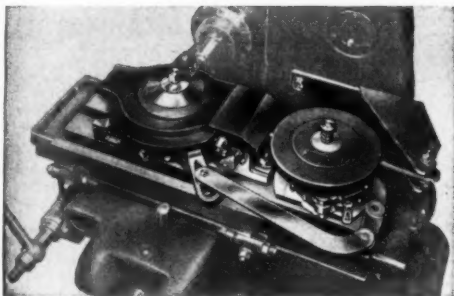


machine bed and the length of work cradles are considered. Another line includes four different lengths between centers, and will accommodate as many as 18 master cams, thus readily taking care of the 16 cams required on the camshaft for an eight-cylinder car, plus

a margin for grinding an eccentric on the same shaft, if desired. The maximum lift or rise of cam that can be generated on these machines is  $\frac{3}{4}$ ".

The operation cycle on this type of cam grinding machine, after a camshaft has been put in place between the cen-

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ters, begins with the operator pressing a button, and then moving one lever. This starts the automatic parts of the machine cycle, the grinder table moving at once into position for grinding the first cam on the shaft. The operator then presses an electric button, whereupon the rocking bar, carrying the camshaft and the master cam spindle, tips forward, bringing the master cam into contact with the roller against which it takes a bearing. The grinding wheel moves in at a high rate of speed, until it just comes into contact with the cam to be ground. It then immediately slows to and continues at regular grinding feed, while the cam makes a predetermined number of revolutions, and thus is ground to the desired size.

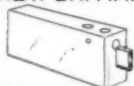
The grinding wheel then moves back quickly, and at the same time, the rocking bar is tipped back, so the master cams completely clear the cam

roller, allowing the table to be shifted without any interference occurring between the master cams and the roller. The table then moves quickly, bringing the next cam to be ground into registration with the grinding wheel. At the same time, the master cam roller is shifted to the particular master cam that corresponds with the next cam to be ground on the shaft. These movements are all timed and controlled by a cycle timing mechanism, and are repeated automatically, until all of the cams and eccentrics on the shaft have been ground.

When grinding on the camshaft is complete, the grinder table reverses its movement, and quickly returns to the starting position. The grinding wheel reciprocation automatically stops at this point, and table travel slows down to a wheel truing speed. The wheel is automatically trued by two passes of a diamond across its face, and

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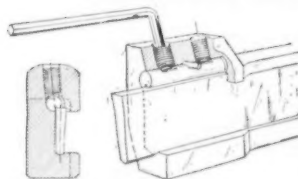
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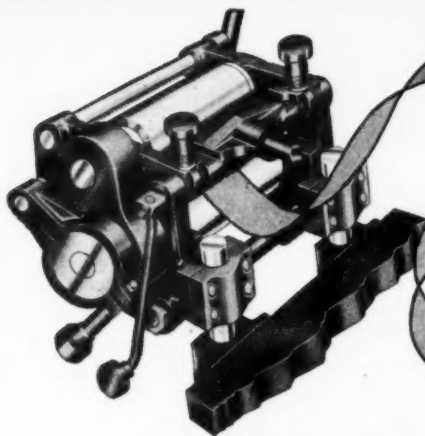
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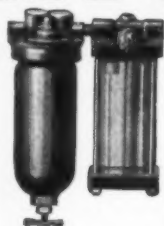
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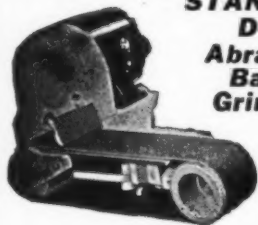
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while this automatically truing of the wheel is taking place, the operator is unloading the completed camshaft, and putting another in place.

Much more, we realize, might profitably be said concerning cam grinding, but it is necessary to draw this series of articles to a close. Just as cam production and application has already reached a high state of development through contributions made by various sources in the past, it will doubtless continue to go forward in days to come. **END OF THE SERIES.**

## MILLING PROCESS SPEEDS PRODUCTION 10-15 TIMES

By attaching a hopper feed fixture of its own design to a U.S. Miller, the Fairchild Camera & Instrument Corporation, Jamaica, N. Y., has devised a rapid automatic milling process for small round pieces, speeding production on this machine 10 to 15 times.

The fixture can be used for any type milling operation, involving one cut or a double cut. The operator has only to load the hopper, whereas he formerly had to give constant attention to the entire milling process. Besides speeding production, the hopper automatically inspects milling pieces, rejecting any oversized parts not up to pre-set specifications. The operator can remove the rejected pieces at intervals, before they clog.

The operator pours the small parts into the hopper, which aligns them in correct position for milling. As the hopper rotates, single parts drop into a chute which automatically feeds them into an air vise.

The part is held rigid in the air vise and is ready for cut. With the air vise loaded, an air valve-controlled cam mechanism, mounted to the side of the milling table, automatically controls the movement of the table. The part is then cut, and a blast of air blows the part into a second chute, leading to a final container. The air vise then picks up another part from the hopper and the same cycle is repeated.

The entire fixture consists of a hopper, made by Fairchild, and a purchased air vise and valve. It was designed by William Umscheid of Fairchild's tool design department.



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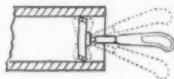
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# Letter from England



Written for the **MACHINE** and **TOOL BLUE BOOK** by Robert Hutcheson, Editor of **MACHINE SHOP MAGAZINE**, London, England.



Preparations are well under way for the British Industries Fair which is to be held early in May. As in previous years the heavy side of the engineering industries will be exhibiting at Castle Bromwich, Birmingham, while light engineering-made products, textiles, chemicals and all manner of other goods will be shown at Olympia and Earl's Court in London. This is the biggest of these Fairs to be held and there will be twenty six miles of exhibition stands covering one million square feet of floor space. Tremendous interest seems to have been aroused this year; many thousands of letters have been received by the Board of Trade from Afghanistan, Bermuda, Chile, China, Uruquay, Venezuela and many other parts of the world. About eleven hundred manufacturers will be exhibiting at Castle Bromwich, broken down roughly as follows: hardware 217, building and heating 246, electrical engineering 223, mechanical engineering 435. There would appear to be improvement in manufacturers's ability to fulfil orders in spite of the difficulties with which our industries are faced today.

Official figures that have been issued relating to exports from the United Kingdom during February show that although the values of £112.9 million is about £6½ million lower than the January figure it is higher than that of any other month since 1920. However, export figures quoted in

terms of money are very difficult to appreciate in view of the changing values of money but even so the volume of exports in February is well above the 1938 figure.

An order placed by Norway for four Vampire jet fighter aircraft figures at some powered by De Havilland Goblin engines will help to swell our export figures at some later date. It is understood that Norway is also negotiating for other aircraft.

Atomic research continues in the news although much secrecy has shrouded the early work done on nuclear physics in Great Britain. Some months ago Dr. H. W. B. Skinner who is deputy director of the Government's Atomic Research Station at Harwell gave a talk to the Atomic Scientists Association on the research work being done at Harwell. The Ministry of Supply, under whose jurisdiction this research work is being carried on, have just released generally the details of Dr. Skinner's talk. The graphite low energy pile had started to operate at Harwell in August and since then a cooling equipment had been put into action. The power had been taken up to the figure of 100 kilowatts and beyond for short periods. It is hoped that the second pile will have a power of operation of several thousand kilowatts by reason of an improved cooling system. It is hoped that the second pile will go into operation some time this year.

As an indication of the wide interest being shown in atomic energy, a paper was given before the Institution of Naval Architects a day or two ago entitled **The Navy and Nuclear Power** by Mr. R. J. Daniel of the Royal Corps of Naval Instructors. Mr. Daniel had studied the effects of the atomic bombs at Hiroshima, Nagasaki and Bikini. In his paper he dealt with the design of ships to withstand effects of atomic bombs and with the use nuclear power for ship propulsion. As Mr. Daniels sees it, the intense radiation from the atomic pile, which necessitates heavy shielding and remote control, reduces the prospect of the use of atomic energy for ship propulsion until some time in the distant future.

Another aspect of ship building which is not quite so phantom as the adoption of nuclear power for marine engines, is the acceptance by the Admiralty of a new submarine, H. M. S. Andrew, built and powered at the Barrow-in-Furness yards of Vickers-Armstrongs Ltd. This new submarine is 282 feet long with a beam of 22 feet. She is fitted with four above water

torpedo tubes and with one four-inch gun and seven smaller guns.

Nationalisation of the railways brings with it its own problems, one of which is an increased degree of standardisation of locomotives. Locomotives are being exchanged between the various regions into which the railway service is now divided, and a series of tests are being made on them. These tests, it is hoped, will enable a reduction to be made in the number of types of locomotives to be built in the future.

No doubt your newspapers have carried reports on the intention of the Government to reduce prices and profits and to peg wages. Such a proposal as set out in the recent White Paper naturally cuts across many private interests and while a good many people feel that other people's wages and profits should be stabilised and a maximum fixed, it is hardly fair to apply the same rule to their own profits or wages. On the other hand, some of the trade associations and many trade unionists are

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in favour of, at least, the broad terms of the White Paper. A day or two back the Trade Union Council called a special conference on the policy of curtailing wages and profits and the result of voting showed 5,421,000 for and 2,032,000 against the Council's support of the Government policy. Among those who voted against support were the Amalgamated Engineering Union and various unions covering electrical trades workers, foundry workers, and chemical workers. The fixing of wage profits and selling prices is obviously a very large undertaking and can be done only by the wholehearted co-operation of everybody concerned. The Federation of British Industries and other industrial organisations have laid before Sir Stafford Cripps, the Chancellor of the Exchequer, their suggestions for curtailing prices and profits. They advised that immediate action should be taken; output should be raised to a maximum with prices and profits being reduced. Several companies in their annual reports have been emphasising the way in which their total income is split up to show that comparatively little of it goes to the shareholders. There is, perhaps, a too wide belief that shareholders in every

company receive as dividends the larger part of the total income. An interesting set of figures has been published by one well known firm of British machine tool builders and their total income for the financial year 1946-47 £1,117,991 is divided as follows:

Materials	£398,139
Wages and salaries	£299,827
Overhead expenses	£225,230
Worker's bonus	£84,344
Government Taxation	£65,850
Reserves	£30,585
Shareholders' dividends	£14,016

An interesting feat of engineering was accomplished recently just outside London in the early hours of the morning. An existing railway bridge was demolished after being in use until midnight and a new bridge weighing 400 tons and 80 feet long was put into position. The new bridge had been constructed on girders alongside the track and was hauled into position over roller bearings. The entire

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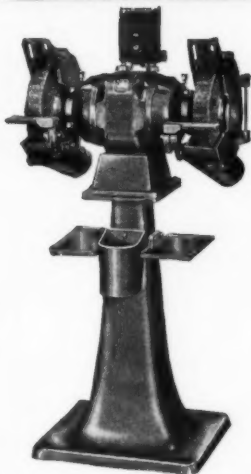
At left is BALDOR Pedestal Type Grinder, 12" series, designed for continuous heavy duty service. Available with 2 H.P. or 3 H.P. (Poly-phase Motor, 1725 R.P.M., 12" x 2" wheels. Manually operated starter, large cast-iron flanges, cast-iron exhaust type guards, adjustable tool rests. Net weight with wheels 425 lbs.

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job of replacement took only 1 hour 12 minutes and the first train passed over the new bridge at 6 o'clock that morning.

What is regarded as one of the most difficult pieces of railway track re-laying that has ever been performed has just been completed in the South of England. This work was done in the very long Polhill Tunnel where 1,188 tons of steel rails, chairs and sleepers and 4,700 tons of ballast had to be removed and replaced with a similar amount of material. A train loaded with prefabricated lengths of track was run into the tunnel as a line was being re-laid. Running on the second pair of rails was a mobile derrick which lifted each length of track and dropped it into the position occupied by an old length that had been removed just a few minutes earlier. A new 60 foot length of rail was laid in every three minutes by this method.

The latest British airscrew-turbine engine that has passed the official type of test having a duration of 150 hours, is the

Armstrong-Siddeley Mamba. The maximum diameter of this engine is only 27½ inches. It weighs only 760 lbs. but it is capable of developing over 1,100 horse power. This means that the Mamba is the most powerful engine in the world for its size. It is intended that this engine should be the power unit in two new types of Royal Air Force trainers, and in the Miles Marathon II airliner and in the Armstrong Whitworth Apollo.

\* \* \*

Two British scientists, Sir Edward Appleton and Sir Robert Robinson, who won the Nobel prize for 1947, were feted by the Federation of British Industries who gave a dinner in their honour on the 19th of March. It was attended by Mr. Attlee, the Prime Minister, who spoke on the outstanding contributions of these two scientists to fundamental research and to the application of science to needs of the community. He said that the award of the prize to these two distinguished scientists was evidence that Britain was in the forefront of scientific endeavour and that this fact was recognised internationally.

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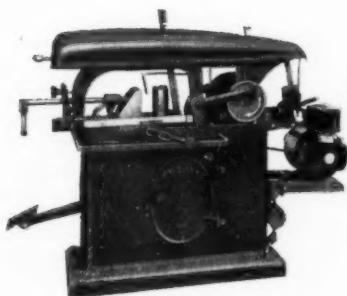


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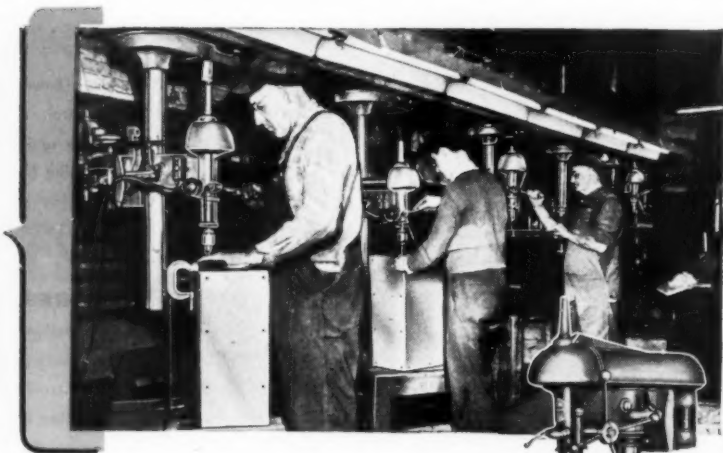
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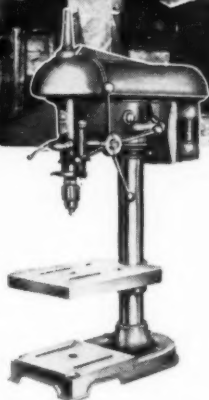
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*Photo, above:* 44 holes of varying size are drilled in metal radar cabinets with Walker-Turner 15" Bench Model Drill Presses. A cumbersome lifting job is eliminated by the overhead mounting.

*\* Photo, right:* 15" Drill Press, Bench Model D-950. 6 spline spindle, 4 ball bearings, 4 1/4" spindle travel, speeds with 1740 r.p.m. motor range from 600 to 5000 r.p.m. Capacity 1/2". Slo-speed motor optional.



**Model D-950 — Price: Less motor and belt guard \$69.50\***



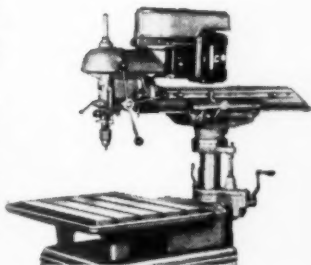
## DRILLING OPERATIONS

How to drill and tap holes in bulky radar cabinets, some five feet high, without lifting them onto a drill press table was the problem faced by the Donnelly Electric & Mfg. Co. of Boston, Mass.

The adaptability of Walker-Turner Machine Tools made the solution simple. A battery of standard Walker-Turner 15" Drills was mounted from above and the cabinets, each requiring 44 holes of five different sizes, were placed on hand trucks and pushed along underneath them.

This is only one example where Walker-Turner Machine Tools are being used in groups and in special set-ups designed by the users to solve unusual problems, or free costlier machines for other work. Because they consider them excellent, rugged all-around machines, Donnelly also uses Walker-Turner Drill Presses for a wide variety of standard operations. Metals machined include cold rolled steel, hot rolled steel, aluminum, brass, and stainless steel.

Light-weight and compact, Walker-Turner Machine Tools offer extreme flexibility of mounting and control. Their wide range of speeds enables them to handle all types of materials from wood and plastics to tool steel. Rugged construction permits many operations, assures long, trouble-free life under the most rigorous production program. And low investment, low operating cost means real savings. For complete catalog, write to Walker-Turner Company, Inc., Plainfield, N. J.



Radial Drill Press, RD-1175J.  
Drills to center of 62" circle  
...16 spindle speeds from  
110 to 8300 r.p.m. Head tilts  
to any angle from vertical to  
horizontal. Price: less base  
and motor \$423.00.

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TOOLS

{ DRILL PRESSES—HAND AND POWER FEED  
RADIAL DRILLS • RADIAL SAWS  
BAND SAWS—FOR WOOD OR METAL  
RADIAL METAL CUT OFF MACHINES • MOTORS

## HOW MUCH MONEY WILL YOU GET

# *from your Social Security?*

by C. M. Feeney

MACHINE and TOOL BLUE BOOK

Before John Wage-Earner can expect monthly benefits to start rolling in upon Retirement Day, he must file a claim for benefits. Money may be lost if this procedure is not followed. John should also know that his "average monthly wage" is the basis for monthly benefits to which he is entitled upon retirement, the monthly amount due his wife at 65, his widow at 65, or his dependent children.

**W**HEN R-DAY (Retirement Day) arrives, will John Wage-Earner know how to go about collecting his Social Security benefits? Will he know, for instance, that if he does not file a claim for benefits, he will not collect? Or, if he procrastinates and files later, does he know that he is losing benefits he is entitled to?

The government has no way of knowing that the glorious day has arrived for John. While he is contentedly toasting his bedroom slippers before the fire and drawing on his favorite pipe, no angel is taking care of John's claim to a monthly stipend. No indeed! If John wants his due, he'd jolly well better know enough to hie himself down to the Social Security office and file his claim.

There are other provisions of the law on which John had better acquaint himself too—the amount of retirement benefits he will be entitled to (if any), the persons eligible for benefits other than himself, what happens in case of his death, etc.

Employers are also interested parties. Since they are bearing part of the cost of social security, they will want to see that the funds are distributed properly. In this connection, briefing John on his responsibilities

# RACINE

*Announces*

## *New!* VARIABLE VOLUME OIL HYDRAULIC VANE TYPE PUMP

### OUTSTANDING FEATURES

**ADJUSTABLE VOLUME** — Pump can be set to deliver exactly the proper volume of oil for any given job.

**ACCURATELY BUILT** — All parts precision made. Accurately ground vanes of special steel are self-compensating for wear. Rotor shaft mounted in anti-friction bearings. Entire pump is self lubricated.

**LOW COST** — Quantity production and standardization of parts make possible low cost that compares favorably with constant volume non-adjustable pumps.



ANOTHER RACINE HYDRAULIC ACHIEVEMENT — the new Model J Variable Volume Oil Hydraulic Pump. Compact Vane Type design allows installation of this pump in a space as small as 6" x 6". It will deliver 1000 pounds pressure per square inch and will maintain a 90% volumetric efficiency.

Variable Volume feature allows horsepower requirement of system to be held to demands of the maximum load. Racine Hydraulic engineers welcome the opportunity to review your needs and make recommendations for complete hydraulic circuits. Write for Catalog P-10-C. Address RACINE TOOL AND MACHINE CO., 1754 STATE ST., RACINE, WISCONSIN.

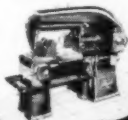
### OTHER RACINE HYDRAULIC PUMPS

Variable Volume Pumps with either manual, mechanical hydraulic or electrical volume control are available in capacities to 50 g.p.m. at pressures of 50 to 1000 lbs. p.s.i.

Four-Way, Balanced-Piston Sleeve-Type hydraulic valves are also available in a wide range of styles and portings. Sizes  $\frac{3}{8}$ " to  $1\frac{1}{2}$ " I.P.S., lever, foot, pilot or solenoid operated.

### RACINE Hydraulic METAL CUTTING MACHINES

If you have a metal cutting job whether it be soft aluminum or hard tool steel, tubing or bar, Racine has a saw in its complete line that will do the job. Sizes range from 6" x 6" to 20" x 20". Ask for catalog No. 12.



# RACINE TOOL AND MACHINE CO.

RACINE, WISCONSIN

*Standard for Quality and Precision*

and benefits under the law falls logically in the employer's lap.

First of all, not every industry is covered. John may shift from a covered industry to one that is not. Among the latter are jobs in agriculture; domestic service in private homes; federal, state or local government service; work in religious, charitable and certain other non-profit organizations; the self-employed; and a few other occupations.

### Definition of "Fully Insured" and "Currently Insured"

Next, John must be "fully insured" before he can qualify for benefits. To be fully insured, he must have been paid at least \$50.00 in covered employment for half the calendar quarters between January 1, 1937 and the quarter in which he becomes 65, or dies.

When John has acquired 40 of these \$50 quarters, he is fully insured for life. His benefits increase if he keeps on working in covered industry; if he leaves covered employment, they decrease.

If John has worked in a covered job for about half the last three years of his life, he will be classified as being "currently insured."

### Computation of Average Monthly Wage

John's benefits would be based on his "average monthly wage" in covered employment. Computation of the aver-

### Examples of Old-Age Insurance Benefits

For a single worker, and for a worker and his wife  
(or for a worker and one dependent child)

Average monthly pay	Monthly benefit payments to—	
	Worker	Worker and Wife
<b>3 years' coverage:</b>		
\$50.....	\$20.60	\$30.90
100.....	25.75	38.63
150.....	30.90	46.35
250.....	41.20	61.80
<b>5 years' coverage:</b>		
\$50.....	\$21.00	\$31.50
100.....	26.25	39.38
150.....	31.50	47.25
250.....	42.00	63.00
<b>10 years' coverage:</b>		
\$50.....	\$22.00	\$33.00
100.....	27.50	41.25
150.....	33.00	49.50
250.....	44.00	66.00
<b>20 years' coverage:</b>		
\$50.....	\$24.00	\$36.00
100.....	30.00	45.00
150.....	36.00	54.00
250.....	48.00	72.00
<b>30 years' coverage:</b>		
\$50.....	\$26.00	\$39.00
100.....	32.50	48.75
150.....	39.00	58.50
250.....	52.00	78.00
<b>40 years' coverage:</b>		
\$50.....	\$28.00	\$40.00
100.....	35.00	52.50
150.....	42.00	63.00
250.....	56.00	84.00

age monthly wage is based on total wages (up to \$3,000 a year), paid in covered employment from January 1, 1937 to the calendar quarter in which the worker files his claim or dies, divided by the number of months in the same period, including months spent at employment not covered by the Act. For example, John might have worked 8 years, or 96 months. The 96 months might include 1½ years of work in an industry not covered by the Act, 6 months of illness and covered employment of 6 years. Altogether, for covered work the amount earned was \$10,800. John's average monthly wage is \$10,800



## APPLICATION FOR WAGE EARNER'S PRIMARY INSURANCE BENEFITS

IF YOU NEED HELP IN COMPLETING THIS APPLICATION, CALL AT, WRITE TO, OR TELEPHONE THE NEAREST FIELD OFFICE OF THE SOCIAL SECURITY ADMINISTRATION

(Do not write in this space)

NOTICE—Whoever makes or causes to be made any false statement or representation in connection with an application for Federal old-age and survivors insurance benefits is subject to not more than a \$1,000 fine or one year of imprisonment, or both.

I, \_\_\_\_\_  
(Name as it appears on my Social Security account number card)

\_\_\_\_\_ (Social Security account number)

hereby apply for the insurance benefits payable to me under the provisions of Title II of the Social Security Act, as amended.

1. I was born: Month \_\_\_\_\_ Day \_\_\_\_\_ Year \_\_\_\_\_

Place \_\_\_\_\_  
(City or town) (County) (State) (Country)

2. I worked in employment covered by the Social Security Act, as amended, for the following employers during the last 12 months:

NAME OF EMPLOYER	ADDRESS OF EMPLOYER	WORK BEGAN		WORK ENDED	
		MONTH	YEAR	MONTH	YEAR

(If you need more space, continue your entries under "Remarks" (on other side) or attach a separate sheet)

3. Do you give the Social Security Administration permission to contact your employer or your former employers? \_\_\_\_\_  
(Yes or no)

4. (a) Are you now working for wages of more than \$14.99 a month in employment covered by the Social Security Act? \_\_\_\_\_  
(Yes or no)

(If in doubt whether your employment is covered, consult the nearest office of the Social Security Administration)

(b) Have you worked in the present month, before execution of this application, for wages of more than \$14.99 in employment covered by the Social Security Act? \_\_\_\_\_

(Yes or no)

In any of the three calendar months immediately preceding the present month? \_\_\_\_\_

(Yes or no)

If so, give the month(s) involved: \_\_\_\_\_

(In answering the last question, do not report for any month(s) before the month in which you attained age 65)

Benefits are not payable for any month in which you work for wages of more than \$14.99 in employment covered by the Social Security Act.

Form OA-C1  
(8-65)

Application form which tells the Government that John Wage-Earner has reached retirement age and is ready to receive monthly benefits due him.

divided by the full 96 months, or \$112.50.

### Computation of Benefits

Benefits are a percentage of the average monthly wage, plus an additional amount for each calendar year in which \$200.00 or more was paid on jobs covered by the law. Even though the exact amount of a benefit cannot be calculated until a claim is filed, John can figure the approximate amount on the basis of his customary pay and the number of years he expects to work.

Suppose that John roughly figures his "average monthly wage" to be \$100.00 and that he has worked in covered employment 9 years. (A) 40% of the first \$50 of his average monthly wage, plus (B) 10% of the balance plus (C) 1% of the sum of (A) and (B) for each year he expects to receive \$200 a month or more in jobs covered by the law will give John his monthly retirement or "primary" benefit. (If John's primary benefit comes to less than \$10, it will be raised to \$10.)

(A) 40% of the first \$50	\$20.00
(B) 10% of balance (\$50)	5.00
Total	\$25.00
(C) 9% of \$25.00 (for 9 years' coverage)	2.25
Primary benefit	\$27.25

### Survivor's Benefits

What benefits he or his survivors are entitled to depends upon John's status under social security. If he had been fully insured at death, monthly benefits would be payable to any of his children under 18; his widow caring for their child until child reaches 18; if no children under 18, his widow at 65; or his aged dependent parents if he left no widow or child.

If John were only "currently" insured, his children under 18 and his widow would be still entitled to monthly benefits. But if he left no dependent children, neither his widow nor his dependent parents (if he were not mar-

ried) would receive monthly payments at 65.

If John (even though fully or currently insured) leaves no immediate survivors eligible for monthly payments, a lump sum payment will be made to the surviving spouse who qualifies or to the person paying the funeral expenses. The lump sum payment is six times the monthly benefit to which he would have been entitled. However, when not paid to the spouse, but paid in reimbursement of funeral expenses, it is limited to the funeral expenses.

### Widow and Children

The actual amount of the benefits payable to the wife or widow and the children is based on what is called the worker's primary benefit. The wife, provided she is 65, receives a payment of  $\frac{1}{2}$  the wage earner's benefit per month and any children under 18 receive  $\frac{1}{2}$  also. However, total payments to one family may not exceed twice the primary benefit, 80% of the worker's average monthly wage, or \$85.00, whichever amount is the least.

John's widow, while the children are under 18, receives  $\frac{3}{4}$  of his primary benefit and the children  $\frac{1}{2}$  each. When the children are over 18, the payments to his widow stop until she is 65, at which time she again receives a monthly benefit of  $\frac{3}{4}$  of his monthly benefit.

To any person who is eligible for more than one benefit, the larger amount will be paid. For instance, John's wife may have worked in a covered job and has, therefore, a social security account of her own. Because of this, she may qualify for benefits at 65 on her own account. She is also eligible for benefits on her husband's account, but she cannot get both. She will get whichever amount is larger.

### Importance of Notifying Social Security Board

Payments, whether retirement or survivors', monthly or lump-sum, are not made automatically. A claim for bene-

fits must be filed before payment can be made. It is important to file a claim promptly; otherwise, benefits may be lost.

John should get in touch with the nearest Social Security Administration field office as soon as he reaches 65. Benefits are payable retroactively only for 3 months prior to the date of filing. Even if John does not intend to retire at once, it may be to his advantage to file his claim immediately. The field office will advise him as to the best course to take.

In the case of John's death, his widow should file immediately after his death. Monthly payments to survivors are retroactive only for 3 months prior to the month of filing. Thus, if she does not file a claim until the fourth month after the month of John's death, she will lose one month's payment.

### **Suspension of Benefits**

The Social Security Administration

will notify John or his wife that claim has been approved and also the circumstances under which their benefits might be suspended. If John goes back to work on a job covered by the old-age and survivors insurance program, his benefits will be suspended for any month in which he earns more than \$14.99. If he takes such a job, he must notify the Social Security Administration, in order that they may stop his check. He will be penalized for accepting benefit checks to which he is not entitled. His benefits will begin again when he stops work and notifies the Social Security Administration.

When benefits are suspended because the worker is employed on a covered job, his wife's benefits, or his child's, also stop. A wife's, widow's or child's benefits are suspended for any month in which such person earns more than \$14.99 on a covered job. Children in a widow's care, however, continue to receive benefits, whether their mother

## **As Every Machinist Knows IT PAYS to BREAKAGE REDUCE TAP**

The DAHLSTROM TAP GUIDE does the job in a fraction of the time required for hand tapping. Because the work is dependably straight and square, tap breakage is practically eliminated—and gone are the hours wasted prying broken taps out of dies. Equipped with seven Adaptors, ranging from 8-32 to 1/2", it takes care of 95% of all tapping requirements. Taps not furnished.

**\$52.50 F.O.B. Minneapolis**

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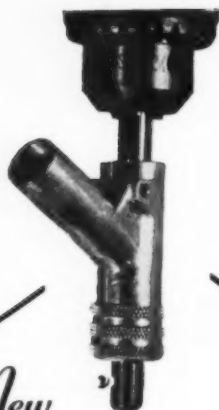
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- 12" x 6" x 14"
- Fastens to wall or bench
- Anyone can operate it



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A new center scope designed to meet today's competitive market—same unquestioned accuracy, same fine workmanship, same high magnification, same simple operation—known as Series "M".

Is lighter in weight than previous models. Use it for all precision locating needs on lathe, drill press, jig borer, vertical boring mill.

Adjustment for line-up to the spindle axis is obtained by turning knurled sleeve at the bottom of the instrument.

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Fitted Morocco Covered Case, \$3.50

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works or not.

A beneficiary may go on and off the benefit rolls from time to time. He may, however, work on a job not covered by this insurance program, or may run a business of his own, and continue to receive his insurance benefits, no matter how much he may earn.

Benefits are stopped for a woman when she remarries or becomes divorced (unless she has earned them on her own account). A child's benefits end when he reaches age 18, gets married, or is adopted by any person other than certain close relatives. (If the worker on whose account the child is entitled is alive, adoption by any person ends the child's benefits.)

**Workers, 65 and Over**

Amendments to the Social Security Act in 1939 made special provision for workers 65 or over. Under the law of 1935, wages earned after 65 did not count toward benefits. The law now provides that from the beginning of 1939 on, wages count toward benefits, regardless of the worker's age. But since this change in the law goes back only to the beginning of 1939, workers who reached 65 before that date cannot count the wages earned between their 65th birthday and January 1, 1939.

**Applicability of Social Security Taxes**

Social security taxes apply to a worker's wages only up to \$3,000 in one calendar year. Thus, if John has had several employers, any or all of whom have deducted taxes from his pay, the Federal Government, on his request, will refund his part of the tax on wages for the year above \$3,000. To get such a refund, John must apply to the Collector of Internal Revenue within 2 years after the year in which the wages are paid. A worker having several employers should keep a list of them and the wages paid to him by each during the calendar year so he can

know whether he is entitled to file a claim for a refund.

### Social Security Card

A worker starting out on his first job in covered employment must apply at the nearest office of the Social Security Administration for a social security account number card. This card bears the number under which his account is kept in the central accounting office. The same number should be shown to every employer, since it is under this number that the old-age and survivors insurance account is filed with the Federal Government. The card has a stub which is detachable and should be filed in a safe place. Then if the upper half is lost, the lower half may be taken to a field office of the Social Security Board and a duplicate obtained. If an employee has more than one number, he should ask at the field office to see which number to keep and turn the other one in.

It is wise also to check on an account once a year by writing to the Social Security Administration, Baltimore, Md., and asking for a statement of account. An addressed post card form, obtainable at the field office, may be sent in.

The Social Security Administration has more than 450 field offices throughout the country at places most convenient for workers. The field office people in all areas are anxious and willing to serve. Two occasions are especially important for getting in touch with the local office of the Social Security Administration: When the wage earner reaches 65 and when he dies. **THE END.**

### LANDIS APPOINTS DISTRIBUTORS

B. L. Sylar & Son, 105 Belvoir Avenue, Chattanooga, Tenn., has been appointed sales distributor in Tennessee for the Landis Tool Company, Waynesboro, Pa. They will handle the complete line of Precision Cylindrical Grinding Machines.

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## WELDER'S SKILL SALVAGES SHATTERED 2-TON CRANKCASE

Using an improvised preheat arrangement consisting of a large floodlight left in the casting overnight, a Sacramento welder accomplished a spectacular reconstruction job on a massive Fairbanks-Morse 300 h. p. marine engine casting, which had been shattered by a broken bolt driven through it by the crankshaft. The casting consisted of a two-ton crankcase 10 ft. long. Repair involved aligning the ruptured sections by passing a threaded rod along the oil sump channel and pulling the broken edges together — a considerable feat in itself, since the heavy casting walls averaged 1" in thickness.

The entire welding operation required 48 hours. A special 1/8" alloy rod for cast iron known as "EutecTrod" 24 was used to avoid excessive fusion and heat absorption by the casting; a great many passes were made, con-

suming a total of 30 lbs. of welding rod. Welds were made both inside and outside, to restore the oil channel.

While the welding sequence might have been varied somewhat, the original ruptures did not extend quite to the ends of the casting, and the weld appears smooth and finished. The rod used develops a tensile strength of 55,000 p. s. i., and the weld is readily machinable. Peening was used, together with the slight preheat, to stress-relieve the finished sections.

Normal replacement of this crankcase would have required three months, which would have likewise suspended extensive dredging operations in the Klamath River area for that period. The unusual emergency weld is directly responsible for savings of extraordinary proportions, according to reports received by Eutectic Welding Alloys Corporation, 40 Worth St., N. Y. 13, suppliers of the special "Low Temperature" welding rod indicated for this repair.

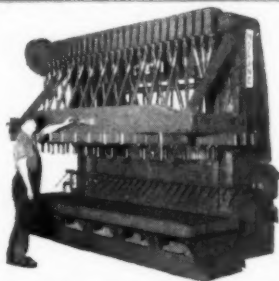


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**BRITISH HOLD  
FAIR MAY 3**

British Information Services, N. Y. 20, report an exhibit of British manufacturers at the British Industries Fair at London and Birmingham on May 3.

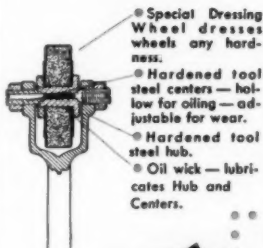
Among some of the new developments to be seen at the Fair are a new development on automatic stitch welding and another on welding of bosses on to sheet metal. The exhibitor will be Fusarc Ltd. of Team Valley, Gateshead-on-Tyne, England.

Murex Welding Processes Ltd. of Waltham Cross, Hertfordshire, England, will show a safety device intended to remove the risk of using a tool employing high open circuit voltage. The "freezing" effect on the muscles frequently resulting from operation of a welding plant or, for that matter, any vibrating tool, is known to doctors as Raynaud's disease, and no cure is known except transfer to other work. Murex have attacked the problem by a timed relay device which reduces the voltage at the handle to 30 within a fraction of a second after termination of a welding run.

Edgar Allen and Co. Ltd. of Imperial Steel Works, Sheffield 9, England, will exhibit, in a series of new processes named Athyweld, a means of deposit-welding high-speed tools made of cobalt and tungsten alloys, high carbon steels and all those alloy steels generally regarded as "unweldable."

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1113 First Ave. S.E., Aberdeen, S. D.  
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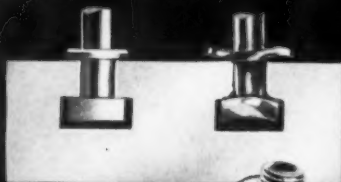
Name.....

Address.....

City.....State.....

The trend of manufacture in vises and tool-holders is from cast iron to fabricated steel. Wilsons of Wolverhampton Ltd. of Trent Valley House, Lichfield, Staffordshire, England, report a doubling in demand for this type of equipment in the last 12 months. The new vises will show grip work-pieces of every conceivable shape, however irregular, as well as tapered work, and several new refinements in position locking and gripping efficiency. Machine vises are packed in special cartons for export.





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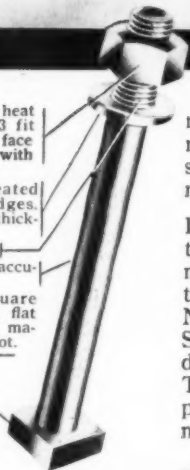
**NUT** of alloy steel, heat treated with Class 3 fit thread, and washer face commercially square with threads.

**WASHER** heat treated steel, chamfered edges. Ground to uniform thickness and hardened.

**THREADS** Class 3 fit.

**SHANK** ground for accuracy.

**HEAD** Machined square with shank. Square, flat surface of head fits machined surface of T-slot.

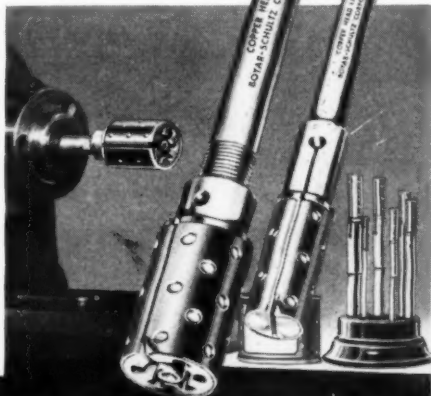


It is cheaper to use precision made bolts than to repair expensive machines. Poorly made bolts of soft steels can quickly ruin the accuracy of a machine.

Boyar-Schultz S. M. B. Bolts are made to protect the T-Slot. They are precision made from upset alloy steel forgings and threaded for a Class 3 fit. Use S. M. B. Nuts and Washers with S. M. B. Bolts for firm, delicate adjustments. They hold work in exact position for heaviest machine cuts.

## BOYAR-SCHULTZ Copper Head Laps

Economy and accuracy are the outstanding features of Copper Head Laps. They work rapidly. Only the replaceable copper sleeves wear out. Sleeve adjustment permits maintaining correct lapping size till worn out when it is replaced with a new one. Save costly tool room time. Available from stock in standard sizes,  $\frac{1}{8}$ " to  $2\frac{1}{2}$ " Diameters.



# BOYAR-SCHULTZ CORPORATION



# THE EFFECT OF TAX POLICY ON *the Machine Tool Industry*



By Tell Berna, General Manager, National Machine Tool Builders' Association

Present depreciation tax laws must be revised if business is to be enabled to buy the new machines necessary for the coming production battle. This address was delivered before the American Machine Tool Distributors' Association, March 16, 1948. Due to its importance to business in general, as well as the machine tool industry, it is being reprinted here almost in full.

**T**HE CITIZENS of the United States may very well be deeply concerned with the present volume of taxes and the difficulty of reducing them. We should also be deeply concerned with the way in which these taxes are collected. Treasury procedure may profoundly affect the welfare of the nation.

The present laws and regulations under which the Treasury operates are a complex accumulation of improvisations, expedients, compromises and repair jobs, going back a century or more. They desperately need to be entirely overhauled.

The Machine Tool Builders are directly concerned because they are taxpayers themselves and because these laws and regulations improperly restrict their customers from throwing out antiquated and wasteful tools.

Expenditures for plant and equipment, far from being encouraged by Treasury regulations and procedures, are as definitely discouraged as if they would sap the very foundations of the Republic.

The machine tool industry has long felt and repeatedly pointed out that the policy for the recovery of capital invested in plant and equipment, better known

as "depreciation," and which forces the taxpayer to proceed on the assumption that the normal life of a machine tool is 15 to 25 years, is harmful to the nation. It is wholly out of keeping with the facts of life. Any plant trying to compete in today's market, to say nothing of the more competitive market of tomorrow, with machine tools of 1925 design is hopelessly handicapped.

Mr. Clay P. Bedford, Vice President in charge of manufacturing of the Kaiser-Fraser Corporation, in speaking to the American Society of Tool Engineers on February 13th, pointed out two practical considerations involved whenever a better machine tool is purchased for the shop.

"First, there is the initial cost of the new manufacturing equipment. Second, there usually must be considered the loss to be taken on the machine tools and other items which are to be replaced.

"Unfortunately, it is this second factor which all too often determines whether the new methods regardless of their efficiency can be adopted at all. The reason is that the machinery to be replaced must be carried on our records at many times its real value in terms of production efficiency and actual obsolescence. It must be carried at this inflated value because of the existing shortsighted depreciation and amortization requirements of our tax laws.

"At best, the effects of these traditional depreciation rules are a serious hindrance to replacement of worn-out manufacturing facilities. Then, when you add new technological developments, which demand complete new tooling for handling new types of material, the effect is obviously doubly restrictive. This is true particularly in highly competitive businesses wherein production costs are all important.

"The answer, of course, is a change in depreciation and amortization reg-

ulations which will allow industry to write off on a short-term basis, those investments which are required to expand facilities in order to create new and more efficient productive power."

What Mr. Bedford says is not new—it is what machine tool builders have been pointing out for years—but it is tremendously encouraging to hear it said by one of our customers—by a user, not a builder—of machine tools. It is when American industry as a whole awakens to the deadening effect of Treasury policy on the recovery of invested capital that we may hope for constructive action.

It is of the utmost importance that machine tool distributors, in their contacts with customers, draw their attention to the essential facts of capital recovery and its effect upon the replacement of obsolete equipment. It is true

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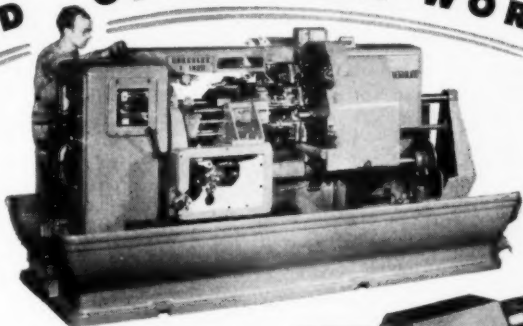
#### SIKORSKY AIRCRAFT USES NEW GIANT PRESSES

Bridgeport, Conn., plant of Sikorsky Aircraft begins use of one of world's largest hydraulic presses to form helicopter parts. Witnessing first production by 5,000 ton Bliss unit are, l. to r., divisional auditor R. A. Aspinwall, tool and equipment supervisor Ernest H. Jochen and factory superintendent Alex Sperber.



# DO SECOND OPERATION WORK

REAR VIEW  
OF GREENLEE  
SECOND OPERATION  
MACHINE



## ON GREENLEE SIX-SPINDLE AUTOMATICS



CLOSE-UP OF WORKING AREA

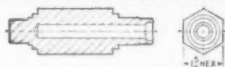
Standard Greenlee Six-Spindle Automatic Screw Machines can be adapted for second operation work, as illustrated above. A typical production piece is shown at the right. Automatic feeding attachments can be furnished for cylindrical pieces (though in this instance hand-feeding was used, with an air-operated loading spindle). Machining operations are performed simultaneously at all positions by both end-working and cross-slide tools in a continuous automatic cycle. Finished pieces are ejected automatically. The machine shown here, which was a center of attraction at the 1947 Machine Tool Show, also included the new Greenlee Lead Screw Feed for better precision threading.



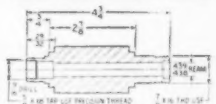
Write today for literature describing features and giving details of the GREENLEE "SIX"—the Operator's Favorite.



EXAMPLE OF WORK DONE



Blanking and Semi-Finishing from Bar Stock



Second Operation Work on Machine Shown Above

Spindle Position	OPERATIONS
2	Load and Unload
3	Drill $\frac{1}{8}$ " hole $\frac{7}{16}$ " deep for $\frac{5}{16}$ " tap. Chamfer end O.D.
4	Counterbore and bottom the same hole. Face end.
5	Tap $\frac{5}{16}$ "-18 right-hand precision thread. (Lead Screw Feed Attachment).
6	Ream .438" diameter hole.
1	Chamfer inside thread.

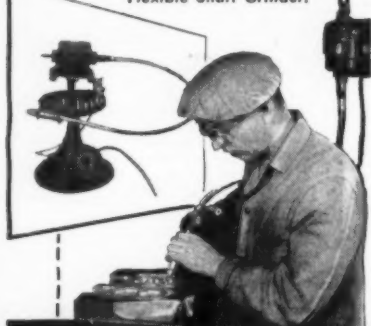
PRODUCTION TIME: 15 SECS.

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1835 MASON AVE.  
ROCKFORD, ILLINOIS

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that large industrial enterprises with very complete records, who are prepared to battle the problem of depreciation through the local representative of the Bureau of Internal Revenue, through the Engineering Committee, down to Washington, and if necessary in the Tax Court, can and do eventually arrive at a sane depreciation policy for their own companies. It is also true that very few companies can wage this battle, and it is impossible for small American business to do so. I venture to suggest that it is in the small shops that you will find the largest percentage of obsolete equipment. It is small American business that is staggering under the heaviest burden of inefficiency and low production per man-hour.

The recommendation of our Committee on Fiscal Affairs, which has been endorsed by the Association, is that the manufacturer should be allowed to establish his own rates for the recovery of his capital invested in manufacturing equipment, provided only that he follows a consistent policy from year to year. They further recommend that depreciation in any year is to be taken only to the extent that it results in a tax saving. To make a bookkeeping entry of the theoretical reserve for depreciation in a year when that money is not actually earned by the company, results only in increasing the loss which reported to the stockholders of the company, but does not put aside in the bank account the money that eventually must be drawn on to buy new equipment.

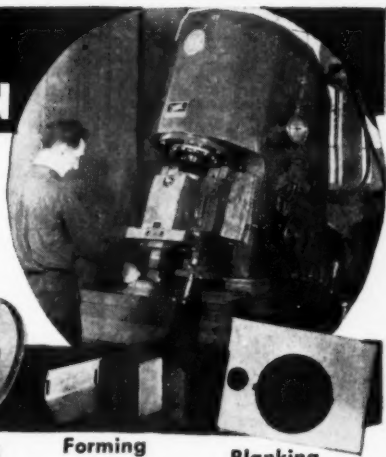
Too often the question of how capital recovery should be handled has been relegated to the bookkeeping department as a detail of bookkeeping procedure. The time has come to regard it as a matter of management policy, and a very important part of management policy if the company is to be kept competitive.

There arises a second problem. On

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Bulletin 4703 shows how the H-P-M Economy Press saves you time and money. Write today for your copy.



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Self-Contained*

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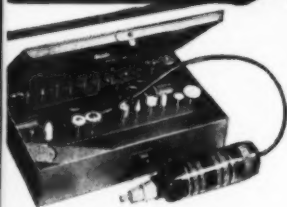
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bone, etc. Plugs in any AC  
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**HANDEE**



First tool of this type and today's finest.  
For precision work. Also gets into hard-to-  
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chinery. Weighs 12 oz. 6½" long. 25,000  
r.p.m. With 7 accessories \$20.50.

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40 accessories in steel car-  
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big fellow. Fast, powerful, sturdy, for  
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### AND SLAUGHTER TOOL COSTS BESIDES!

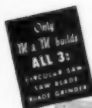
Digest the data below, and ask us to present other figures similarly startling and equally convincing. The Motch & Merryweather Triple-Chip Method has no competition in point of material saving, productivity, low tool cost, and quality of work performed. We welcome your challenge to prove these claims, especially by being given the opportunity to tackle your most difficult cut-off problems. *The answers are here.*



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1 3/8" 1 3/8"



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Weight of metal - 3 lbs. per cu. in. Cost - \$.35 per pound. Thickness of piece - 3/8". Run-out with Triple-Chip Method - none; with "alternate method" - 1/2", losing 29% of metal. This meant 9 cu. in. (2.7 lbs.), or \$.945 per cut. "Alternate method" yielded one cut or less per grind; tool cost per cut - \$1.26. Triple-Chip Method gave 67 cuts per grind and 60 re-grinds; tool cost per cut - \$.108. Time consumed to make 4020 pieces: by "alternate method" - 4020 hours; by Triple-Chip Method - 934.2 hours.



Which method is better?  
Ask for full details now.

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## NEW HOLE PUNCHING UNIT

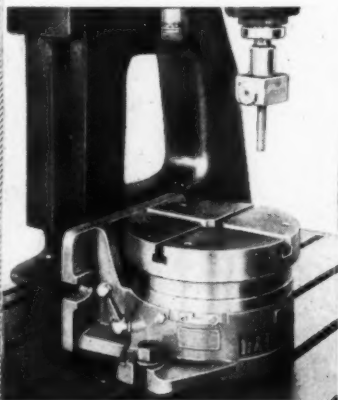
A new hole punching unit, type EJ, has been announced by Wales-Strippit Corp.

*Strip  
Change  
Method*

By designing this Wales Type "EJ" Hole Punching Unit with a center projection to carry the die, one of metal fabricators' most difficult hole punching problems has been eliminated—punching a series of holes simultaneously in angles, channels and extruded shapes. The center projection may be rotated to punch these various extruded sections.

For the "Strip" Template Method of setups, hole locations are drilled andreamed in the "Strip" Template for the pilot pin. These Templates are combined pattern and base plates which permit the "Strip" Templates not in active use to be stored for future runs and the group of Type "EJ" Units which has been removed is kept in continuous operation on other "Strip" Templates. This eliminates "dead storage" units. Write for Catalog C to:

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**\$18.75**  
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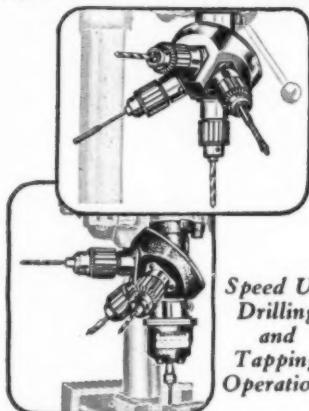
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**CHICAGO**

**DRILLER CORPORATION**

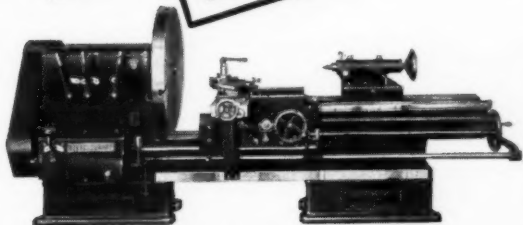
1735 N. Winchester Ave., Chicago 22, Ill.

this the Treasury can be of no assistance. A machine tool bought in 1920 for \$5,000 cannot today be replaced for \$5,000. It is true that the machine of the same size and type purchased today is far more productive and far more accurate. It will give a much better finish on the work to be done. Nevertheless, there must be set aside, in addition to the recovery of the capital originally expended for that machine tool, an additional sum to be used for the purchase of new capital equipment. Otherwise the company will some day find itself unable to keep its shop in competitive condition. It will find that it has reported as earnings, or distributed to its stockholders as dividends, money that should have been placed in reserve in order to maintain the working efficiency of its plant. It would literally have paid out its capital as dividends.

In the last annual report of the Chrysler Corporation it is stated: "The original cost of all buildings, machinery and equipment now owned and used in operations, was better than \$210,000,000. It is estimated that their replacement at today's price level would cost \$352,000,000. Against this eventuality to date there have been accumulated depreciation reserves of \$130,513,952. Accumulated depreciation reserves are considered by the management to be adequate in relation to original costs, but fall far short of representing an adequate accumulation to cover the cost of their replacement at inflated prices. If the present price levels continue to rise, it is apparent that the ultimate replacement problem can only be met without resort at some time in the future to capital financing, by accumulating cash balances from current operations."

Another Treasury regulation that is especially harmful to American business is Section 102 of the Treasury Regulation, which applies a drastic ad-

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It will pay you to investigate the remarkable, low cost results the WICACO Continuous Oil Groover offers. Write today—outline your oil grooving problem and complete information will be sent without obligation.

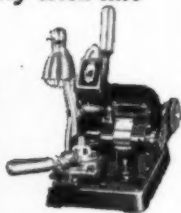


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It's a high-speed, motor-driven unit that has many uses in finishing operations for light cuts on aluminum, brass, steel and other metals... also, rounding and burring steel and cast iron. Inexperienced operators quickly learn to use it with speed and precision.

The Rouse Hand Miller, with Rouse Fixture Set-Ups, provides fast, accurate, low-cost milling for a big variety of small parts used in electrical work, instruments, aviation, communications and similar work.

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ditional tax on a business enterprise that does not distribute what seems to the Treasury an adequate part of its annual earnings in the form of dividends. More hurtful than the regulation itself, which is infrequently applied, is the mere fact of its presence on the books, so that the taxpayer never knows when that club is going to be brought out from behind the door. The taxpayer may learn in 1948 that the Treasury does not approve of his policy for distributing his earnings of 1945, long after the money has been put back into his plant and into better equipment and is not available for the purpose of paying a penalty to the United States Government.

The fear of a drastic or unfair application of the Treasury Regulation is just as real a force influencing company policy as if the regulation were rewritten with the intent of being drastic and unfair.

It is clearly unwise for small American business to distribute too much of its earnings in the form of dividends to stockholders when they represent the only way in which that enterprise can be built up and can be kept efficient.

Our industry has taken its stand on that question as well and has recommended either the outright repeal of Section 102 or its modification, to apply only to cases of deliberate and proven tax evasion. In any case the penalty should be levied only on that portion of the surplus which is determined to be unreasonable and the burden of proof should be upon the Treasury Department.

One Congressman suggested to me recently that in case of an inequity in tax regulations or in the application of those regulations, the taxpayer can always take his case to the Tax Court.

I would respectfully suggest that

this is not a remedy within reach of small American business. A small business enterprise cannot afford the interminable delays of court procedure or the extremely high cost, or the distraction of its few executives from their proper duties.

This suggestion is like feeding tainted food to your children with the comforting assurance that there is a hospital in town.

The things that we are discussing here today are not merely a question of increasing the earnings of the machine tool builders. These are the things that men live by. The very stability, the continuance of our free enterprise system, depends upon a revision of our thinking in the field of taxation and the creation of conditions that will give small American enterprise a chance to survive. THE END.

## N. Y. WELCOMES NEW BEARING FIRM

Formal opening of Dalc Bearings, Inc. (1974 Broadway), first new business to open on Broadway in 1948, was attended by Robert K. Christenberry, president of Broadway Association, who is shown cutting tape strung with new firm's anti-fric-

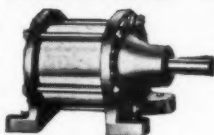


tion products. Clayton A. Decker, (left) president of Dalc, and (right) James Sauter, New York City's Deputy Commerce Commissioner. The new company specializes in engineered application and sale of anti-friction bearings made by several leading manufacturers.

# AIR-MITE

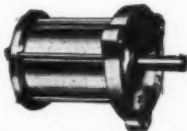
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WRITE for complete new general catalog of AIR-MITE pneumatic spring return material holding devices, arbor presses, fittings and controls.



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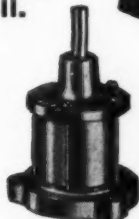
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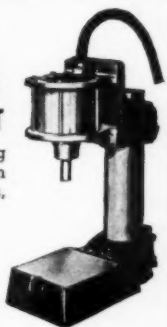
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PRESSES**  
**2 Sizes—**  
**1/4 and 1/2 Ton**

# Adjustable MULTI-DRILL

for Production Drilling

3" DRILLING AREA  
AVAILABLE WITH 2 TO 8 SPINDLES

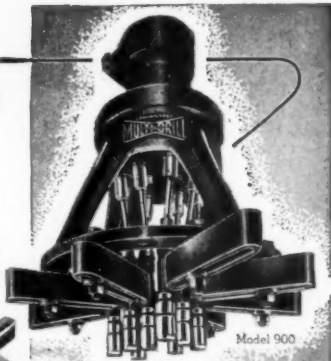
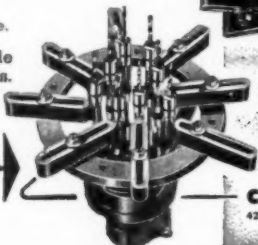
- Designed for accurate, high speed production drilling
- RUGGED CONSTRUCTION
- Quick, easy adjustments to **any** hole pattern on or within a 9" circle;  $\frac{1}{2}$ " minimum center distances; Drill sizes  $\frac{1}{16}$ " to  $\frac{3}{8}$ "
- Special adaptations available.

MULTI-DRILLS are made in other sizes and models.

Write for details and name of your Distributor.

Locator arms are designed for fast, easy adjustment

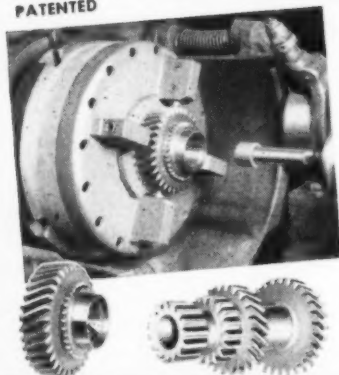
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## **ALUMINUM CASTINGS**

Pictures of Sand and permanent mold aluminum castings and weight. Features and details of performance. 4 pages. **Advance Aluminum Castings Corp., Dept. BB, 2742 W. 36th Pl., Chicago 32, Ill.**

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Visual units for planning factory layout, etc. Also describes 1/4"-scale material handling equipment, 1/4" scale chemical and process equipment and 1/4" graph planning boards. 4 pages. **Visual Production Planning, Inc., Dept. BB, 5102 Butler St., Pittsburgh, 1, Pa.**

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Pictures of Bradley-equipped washrooms, designed for group washing, in plants, schools and institutions from different parts of the world. 24 pages. **Bradley Washfountain Co., Dept. BB, 2203 W. Michigan St., Milwaukee, Wis.**

## **CONTACTS**

Covers contact materials, elkonite facings, copper-base contacts, backing metals, special purpose contacts, standardized electrical contacts. Appendix includes ordering information, patent information, recommendation sheet and news of other products. 42 pages. **P. R. Mallory & Co., Inc., Dept. BB, Indianapolis 6, Ind.**

## **MIDGET HYDRAULIC UNIT**

Describes applications of "Ten Ton Tony," and gives performance data. Applicable to road machinery. 4 pages. **Hydro-Power, Inc., Dept. BB, Belmont & Sheridan Aves., Springfield, Ohio.**

## **TAPPING MACHINE**

Describes lead screw feed, heavy roller-bearing mounted spindle, clutch, depth control, coolant supply, spindle speed, pulleys and belts, etc. Specifications and list of optional equipment. Illustrated. 12 pages. **The Cleveland Tapping Machine Co., Dept. BB, Hartville, Ohio.**

## **TESTING AND REPORTING**

Explains heating, quenching, grinding, Rockwell testing, interpreting, reporting and delivering procedure of tests and reports on alloys. Sample of Alloy Steel Report. 8 pages. **Joseph T. Ryerson & Son, Inc., Dept. BB, Chicago, Ill.**



# Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding ... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work—longer wheel life.

Buy Kipp air tools for best results, lower prices.

MODEL JA  
50,000 R. P. M.

**\$42<sup>00</sup>**

IN U. S. A.



Weight 12 ounces;  
length 6¼ inches;  
chuck size ⅜ inch.  
Wheel guard re-  
moved for better  
illustration.

**MADISON-KIPP CORP.**

207 Waubesa St., Madison, Wis., U. S. A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

## ELECTRIC SPEED INDICATOR

Covers mountings, connection and installation, dimensions, parts and accessories prices, standard and special scales and dials. 8 pages.

Reliance Electric & Engineering Co., Dept. BB, 1076 Ivanhoe Rd., Cleveland 10, Ohio.

## SCREW THREAD INSERTS

Describes how Heli-Coil Inserts are being used by some manufacturers in their products. Tells about salvage applications. Describes power and hand installation of tool. 4 pages.

Heli-Coil Corp., Dept. BB, 47-23 35th St., Long Island City 1, N.Y.

## POW-R TRUCK ELEVATORS

Discusses strengthening platform frame and diagonal bracing, special flooring, construction of car frame, use of special hoisting machines, automatic control. Illustrated. Requirements for hoistway structures in industrial buildings. 8 pages.

Otis Elevator Co., Dept. BB, 260 11th Ave., N.Y.1, N.Y.

## ADJUSTABLE SPEED DRIVE

Describes control unit, motor, speed adjuster, push-buttons, method of operation, acceleration. Illustrated. 4 pages. Reliance Electric & Engineering Co., Dept. BB, 1076 Ivanhoe Rd., Cleveland 10, Ohio.

## RESEARCH FACILITIES

Explains operation of Multipress laboratory testing schedule. Folder.

Denison Engineering Co., Dept. BB, Columbus 16, O.

## HEAT TREATING REVIEW

Pictorial presentation of surface combustion heat treating furnaces and heating machines recently installed. Covers suspended carburization, gas burner equipment, carburizing furnaces, etc. 8 pages. Surface Combustion Corp., Dept. BB, Toledo 1, Ohio.

## CARBON & GRAPHITE

Physical characteristics, corrosion resistance, and chemical, metallurgical, mechanical and electrical applications. Dimensions of pipe fittings, performance curves of pumps, physical properties, etc. 20 pages.

National Carbon Co., Inc., Dept. BB, 30 East 42nd St., N.Y. 17, N.Y.



### THREADING MACHINES

Features include cut-off guides and tool, lever operated die-head, open type vise, thread length gauge. Includes pictures, specifications and description. 8 pages. **The Oster Mfg. Co., Dept. BB, Cleveland, Ohio.**

### SURFACE GRINDERS

Construction features include motor mounted directly on wheel slide, wheel spindle positioned in slide and moved on flat and vee ways, chuck spindle mounted in double row ball bearings. Specifications and illustrations. List of dealers and distributors. 4 pages. **Arter Grinding Machine Co., Dept. BB, Worcester, Mass.**

### DRILLING UNITS

Description and photos of models and features. Explains drive, belt tension, speed changes, enclosed belt guard, etc. Specifications. 8 pages. **Canedy-Otto Mfg. Co., Dept. BB, Chicago Heights, Ill.**

### WESTINGHOUSE PRECIPITRON PAYS FOR ITSELF IN ONE YEAR

Oil mist in the screw machine room of the Wolverine Brass Works, Grand Rapids, Michigan, has been eliminated by the installation of Westinghouse Precipitrons. Together with improved working conditions, savings accrue from reduced maintenance—cleaning ceilings, girders, lighting fixtures, etc.

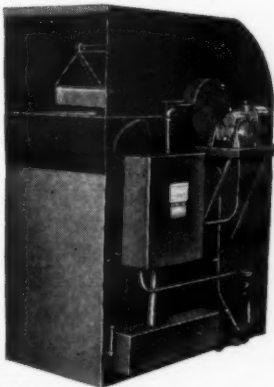


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### CONVEYORIZED PERFORMANCE!

- Controlled cleaning Cycle!
- Open top degreaser cost!
- Timed for proper cleaning!
- 75% reclamation of solvent!
- Great economizer of labor!
- No installation costs!



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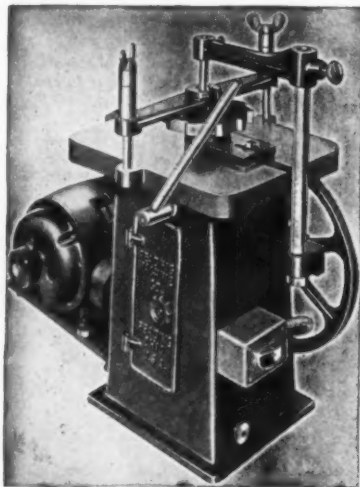
the perfect cleaning solvent for all metals or combinations of metals. PHILLSOLV will not affect or stain highly polished surfaces. Send for **FREE Booklet** "Questions and Answers on Vapor Degreasing".

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3455 Taubay Ave., Chicago 45, Ill.

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## THE READING BROACH KEYSEATER



The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from  $\frac{1}{8}$  to  $\frac{3}{8}$  cutter. Prompt delivery—low first cost.

**READING MACHINE CO.**  
READING (CINCINNATI) OHIO

### ALUMINUM SHEET & PLATE

Covers technical information on sheet and plate alloys and gauges and sizes. Comparative analysis of costs as against other metals. Advantages of using coiled or flat sheet. Summaries of information on formability, weldability, riveting, etc. Explanation of heat-treatable and non-heat-treatable alloys. Ordering data, tables for computing weight of sizes and thickness of aluminum circles. Comparison of gauges and decimal equivalents of aluminum sheet and plate gauges. Index of specifications for sheet and plate according to government bureaus and some professional societies. 48 pages. Reynolds Metals Co., Aluminum Divn., Dept. BB, 2500 S. Third St., Louisville 1, Ky.

### OIL PURIFIER

Describes equipment and operating example of continuous circuit central systems for purification or clarification. Also operating example of modified system for purification of cutting oils and clarification of coolants for single machines. 8 pages. Honan-Crane Corp., Dept. BB, 215 Wabash Ave., Lebanon, Ind.

### MACHINING LARGE WORKPIECES

Table, floor and planer type machines. Features, illustrations and attachments. Specifications. 6 pages. Giddings & Lewis, Dept. BB, Fond du Lac, Wis.

### LATHE

Automatic Cycle Lathe for forming, facing and other cross feed operations. Description, photographs, equipment and specifications. Indexed drawing. 4 pages. The Oster Mfg. Co., Dept. BB, Cleveland 3, Ohio.

### PORTABLE HORIZONTAL MACHINES FOR DRILLING & TAPPING

Illustrates how movement of machine head positions cutting tools at any angles. Explains features and advantages of five models. General specifications and operating details. Pictures of how machines are used in varied planes, positions and locations. 8 pages. Kaukauna Machine Corp., Dept. BB, Kaukauna, Wis.

### **FLEXIBLE COUPLINGS**

Design, application, selection and prices. Dimensions and list prices. Horsepower ratings. Drawings and photographs illustrate features. 8 pages. **Baldwin-Duckworth, Dept. BB, Springfield 2, Mass.**

### **ADHESIVES**

Cites 18 case histories and lists 26 formulae. Pictures bonding operations of plywood to metal and vinyl sheeting to wood; sealing in aircraft cabins, auto bodies and boat decks; and anti-corrosion coatings for metal. 28 pages. **Minnesota Mining & Mfg. Co., Dept. BB, 901 Fauquier Ave., St. Paul, 6, Minn.**

### **BROACHING MACHINES**

Close-up views of tools, fixtures and machines for broaching internal surfaces. Method of automatic tool handling, work centralizing and work ejection. Time, labor and power saving design and operational features. Specifications. 12 pages. **The Oilgear Co., 1344 W. Bruce St., Milwaukee 4, Wis.**

### **INDUSTRIAL WELD REPAIR**

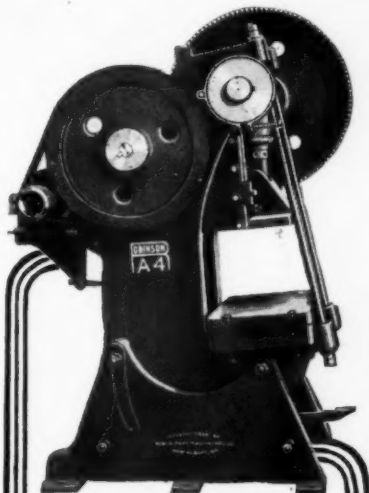
Simplified welding technique for maintenance and repair of metals, forms, castings, shapes and heavy machinery components. "Railroad Salvage Bulletin 'R' ". 4 pages. **Eutectic Welding Alloys Corp., Dept. BB, 40 Worth St., N.Y. 13, N.Y.**

### **BALANCED LIGHTING**

Examples of lighting for various jobs and illustrations and descriptions of fixtures. Tables of footcandles required to light certain work areas. 6 pages. Also 12 page folder recommending procedure; and providing guide for footcandle levels and illustrations of lighting applications. **The Fostoria Pressed Steel Corp., Dept. BB, Fostoria, Ohio.**

### **TESTING AND MEASURING EQUIPMENT CATALOG**

Information on magnetic and time, speed and torque measuring equipment; gages; spectro, insulation testing, vibration, sound and balancing, and electric circuit testing equipment. 43 pages. **General Electric Co., Dept. BB, Schenectady 5, N.Y.**



## *The* **ROBINSON** *Inclinable* **PUNCH PRESS**

*The* new and improved Series A Robinson Punch Press is noted for safe, dependable operation. Sturdily built and employing finest construction features, a Robinson Series A offers years of trouble-free operation at minimum maintenance cost. Five sizes now available for immediate delivery.

**New Albany Machine Mfg. Co.**  
NEW ALBANY, IND.

**ROBINSON**

*Inclinable*  
**PUNCH PRESSES**

Busy days ahead!



**ITEMIZED  
CERTIFICATE OF INSPECTION**

Shows you which blocks, if any, are inaccurate and the extent of inaccuracy. Issued with each inspection.

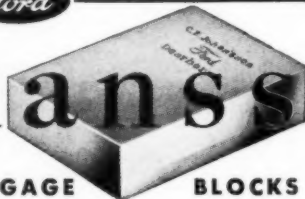
It MAY be that long service or careless handling has worn many of your most-used gage blocks until they're 'way out of tolerance. It pays to know which blocks need reconditioning or replacement. Send your whole set of blocks in to Ford for inspection. Cost is only 25 cents a block for "A" and "B" blocks up to one inch, or for each inch of length of longer blocks. (Minimum charge \$1.) Details, methods, costs, of reconditioning your gage blocks, including the Ford chrome-plating method, sent on request. Write—

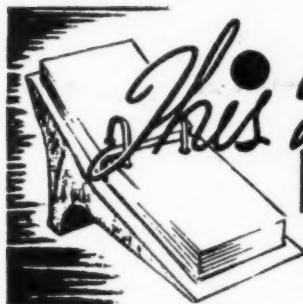
**FORD MOTOR COMPANY • JOHANSSON DIVISION**  
3606 Schaefer Road, Dearborn, Mich.



# Johansson

**GAGE BLOCKS**





# This Month's INDUSTRIAL FILMS

## MEEHANITE MEANS BETTER CASTINGS

Meehanite Metal Corp.  
Pershing Square Building  
New Rochelle, N. Y.

*30 minutes. Black and white. Sound.  
16 mm. Obtainable from Meehanite  
Metal Corp.*

Written and produced for designers, engineers, production and maintenance men, purchasing and managerial executives, this movie provides definite engineering facts and figures about Meehanite castings, their types and applications.

It takes the audience into the office of a metallurgist for the story of foundry

dry control in production which makes possible the regulation and achievement of required service qualities. The foundry of a manufacturer and plants and machine shops of users are visited. The nine important engineering properties of Meehanite castings are described and illustrated.

Alternate showing dates should be requested, if possible, when asking for copy of this picture.

• • •

## TAKE IT FOR GRANTED

New England Electric System  
441 Stuart St.  
Boston 16, Mass.

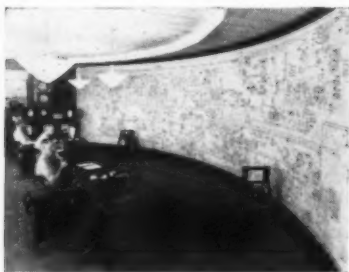
*28 minutes. Color. Sound 16 mm. Obtainable from New England Electric System.*

This is the story of the operation of the New England Electric System. To get this story across to the public, the art of making and distributing electricity has been broken down into understandable layman's language and the picture is filled with sequences devoted to the daily tasks performed by employees. It is an impressionistic film built around the premise that if one person neglects his job, the whole system,



or a great part of it, may fail.

The filming of the picture took place in many New England cities and towns and many scenes are devoted to natural beauty shots which show the New England area at its best. Photography began in Providence, Rhode Island,



where pictures were taken of New England Electric System's tidewater steam generating plants and of retail company operations. Sections of the film are devoted to the delicate problem of dispatching electricity and scenes are shown of the System's main dispatching station at Millbury, Massachusetts, and at other large substations throughout New England.

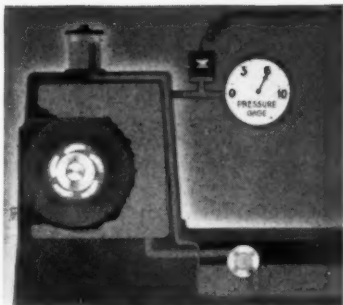
• • •

#### AGE OF PRECISION

The Cincinnati Milling Machine Co.  
Cincinnati 9, Ohio

*30 minutes. Kodachrome. Sound. 16 mm. Obtainable from Cincinnati Milling.*

This film dramatizes the special impact of cylindrical grinding improvements on all our lives during the past quarter century. Among today's feats detailed in the film is a job held to dimensional tolerance under 7 millionths of an inch. An important ani-

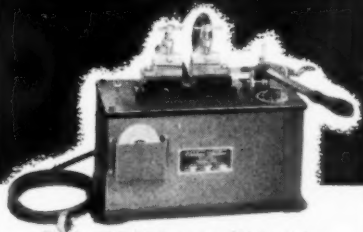


mation sequence explains the Filmatic bearing, in which the spindle rides on oil with no metal-to-metal contact, yet is held as firmly as in a vise.

When requesting film, two or three alternative showing dates should be mentioned, as film is not always available immediately.

• • •

#### Weldex Bandsaw Welder



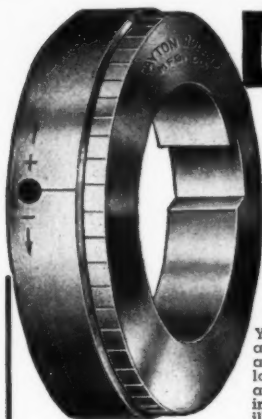
Flash welds blades up to  $\frac{3}{4}$ ". Ideal for intermittent wire butt welding applications. Eliminates joint preparation and "special flux". Instantly burns off surface irregularities.

5 weld stations, 1 anneal station. 110 and 220 volt models. For details write

## Weldex Int.

7325 McDonald

Detroit 10, Mich.



## FAST, ACCURATE SPACING

Graduated in thousandths, you have plus or minus .0005" at your fingertips with

### DAYTON ROGERS ADJUSTABLE SPACING COLLARS

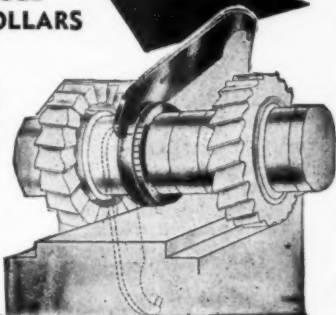
You can make an accurate, positive adjustment just by loosening the cutter arbor nut and making adjustment as illustrated.

Made in 12 standards for cutter arbors from  $\frac{7}{8}$ " to 2". Write for illustrated Bulletin 120-7.

**DAYTON ROGERS MFG. CO.**  
2849 12TH AVE. SO., MINNEAPOLIS 7, MINN.

for  
**SIDE MILLING  
CUTTERS**

**GANG MILLING  
SET-UPS**



## Dependable MEASURING & CHECKING EQUIPMENT

*Ready to Deliver*

**STRAIGHT and OFFSET TYPE HAND WHEELS**



**STANDARD CAST IRON HAND KNOBS**



**MACHINE HANDLES**

We also build jigs, fixtures, special tools and machinery. Send us your blueprints.

**MALLEABLE IRON LEVERS**



**UNIVERSAL ANGLES**

In 10 sizes, ranging from 4 x  $3\frac{1}{4}$  x 5 and up.

**BOX PARALLELS**

In 15 sizes, ranging from 3 x 4 x 12 and up.

**NOTED ANGLES**

In 19 sizes, ranging from 4 x 9 x 5 and up.



**SURFACE PLATES**

Over 50 sizes, ranging from 7 x  $7\frac{1}{2}$  to 96 x 192.

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## MACHINE PRODUCTS CORPORATION

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# **NEW TECHNICAL BOOKS**

## **TOOL STEEL SIMPLIFIED**

*By Frank R. Palmer, president and George V. Luerssen, chief metallurgist, The Carpenter Steel Co. Published by The Carpenter Steel Co., Reading, Pa. Revised 1948. 564 pages. \$2.00 in U. S. \$2.50 elsewhere.*

The revised handbook contains practical, common-sense information that can simplify the job of getting better, longer-lasting tools and dies. It is written in non-technical language to give the shopman practical help in his everyday job. It will help him show his company how to raise production from present equipment, reduce machine downtime, and hold unit costs in line.

Revisions supply timely data that can further simplify the tool room problems that keep arising. Diagrams, charts, photographs, tables — a total of 355 illustrations are used to clearly drive home each point. The book helps shop men to select the proper steel for each job, simplify heat treating, reduce tool failures and save time and effort on the job. It is valuable as a training aid in that it helps instructors and supervisors train new men and "up-grade" skilled men.

Skilled toolmakers will find new information on air-hardened steels, a new approach to hardenability (hardening penetration), new chapter on high speed and hot work steels, a useful alphabe-

tical Tool Steel Selector, etc. Younger men in the trade will find that the book takes them along, step by step, to an understanding of tooling operations. All those who have read the first edition will discover new material, and new and better techniques, in this more complete volume.

---

## **SAFETY SUPERVISION IN MOTOR VEHICLE FLEETS**

*Edited by Milton D. Kramer. National Conservation Bureau, 60 John St., N. Y. 230 pages. \$2.25.*

This is a comprehensive and practical treatment of activities relating to driver selection, testing, training and supervision. Its publication is an outgrowth of nearly ten years' experience in training fleet safety supervisors at the Center for Safety Education and at other training centers.

The literature in this field has been limited mainly to pamphlets, mimeographed bulletins and miscellaneous articles and reports until the publication of this book. This volume presents techniques, practical methods and guiding principles of safety and supervision. It is designed to meet the needs of fleet safety engineers, personnel supervisors, maintenance foremen, fleet owners and operators, enrollees in college-conduct-



ed fleet supervisor training courses, insurance company safety engineers, instructors and lecturers, safety personnel employed by educational, safety and governmental bureaus, and others active in the field.

The book's seven main chapters include: Motor vehicle transportation, fleet supervisor training and safety; Content and organization of a fleet safety program; Supervision, psychology and improving driver performance; Training employees and methods of teaching; Driver selection and testing; Preventive Maintenance; and Traffic regulations and driving techniques. Numerous tables and illustrations point up the book's contents.

#### MANUAL OF FOUNDRY AND PATTERN SHOP PRACTICE

By Otis J. Benedict, Jr. McGraw-Hill Book Co., Inc., 330 W. 42nd St., N. Y. 18. 361 pages. \$3.25

The emphasis is on the fundamental processes of pattern design and construction, molding, cupola operation, pouring, cleaning and inspection of castings. Part I is a text on foundry processes. Part II is a text on pattern design and construction. A feature of the book is the list of visual aids — motion pictures and film strips — correlated with the material in the text.

Subjects covered are foundry practice, molding practice, molding tools and molding operations, cores and coremaking, nonferrous materials, patternmaking, pattern allowances, materials, construction methods, characteristics of wood, seasoning lumber, glues, etc.

The quality of a product is dependent upon the degree to which operations and material are specified and controlled. Specifications must be checked and studied, and modified if new methods are brought into being. The chapter on Technological Control explains the components of foundry sand, so impor-

tant to quality castings and covers molding, core, green and parting sands. Sand is graded and classified according to grain-fullness and clay content. Composition of castings are recommended for certain types of products.

No attempt has been made to cover the whole ferrous and nonferrous field, but to set forth the fundamental principles as applied to the production of gray-iron castings.

#### THREADING INTERNAL & EXTERNAL TAPPING HEADS

File kit of four bulletins describing Drill Press tapping Attachments, Friction Tap Holder, Chucks and Collets; and Tapping Machines, Universal Series "D" and "A". Gives features, illustrations, specifications, diagrammatic drawing, and descriptive material on each. Proconier Safety Chuck Co., 14 S. Clinton St., Chicago 6, Ill.

M-T

**41 PIECE  
SET-UP NUT  
and STUD SET**



**AT YOUR FINGER TIPS  
WHEN YOU WANT THEM.  
TOUGH—THEY CAN TAKE IT.**

1/8" Set .....	\$21.00
3/16" Set .....	23.00
1/4" Set .....	26.00

Standard equipment for every machine tool.  
Immediate Delivery.  
fob Ferndale Plant

Write for Catalog and Templates on M-T Fixture  
Clamps and Components.

**Morton Machine Works**  
**2422 Wolcott      Detroit 20, Mich.**

# CURTIS JOINTS

*Facilitate  
Changes...*

**... SAVE  
MAINTENANCE  
TIME**

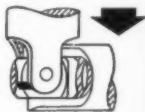
Yes, it really pays to use Curtis Universal Joints for industrial power applications. The patented Curtis "Telltale" Lock Ring is worth many dollars of maintenance time, because:

1. It makes renewal of pins or center block a simple operation — no dismounting of shaft, brackets or bearing supports.
2. Permits easy installations in limited space — due to simplicity of disassembly and reassembly of Curtis Universals.
3. Reduces shut-down time of machines.
4. Increases the long life expectancy built into every Curtis Universal by skilled craftsmen using the finest of materials and heat treatments to reduce frictional wear.
5. Meets all Government specifications — eliminates need for any screw locking devices.
6. Allows a visual check at all times for correct and secure assembly.
7. Assures peak operating performance.

Only in Curtis Universal Joints are all these attributes to be found. Be sure of the finest — Specify Curtis Universal Joints for all industrial applications.

WRITE DEPT. B-1

"The Curtis 'Telltale' Lock Ring is visible at all times."



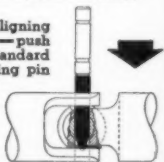
**To Disassemble:**

Support joint rigidly with smallest pin in vertical position. Press out small pin. Be sure Lock Ring in center block recess is not lost.

**To Reassemble:**

1. Mount parts ready for final insertion of small pin — be sure "Telltale" Lock Ring is in its recess in center block.

2. Insert pointed aligning pin in small hole — push through with standard small pin. Aligning pin spreads Lock Ring, which will snap into groove in standard pin and lock whole assembly.



**CURTIS UNIVERSAL JOINT CO. INC.**  
4 BIRNIE AVENUE • SPRINGFIELD 7, MASSACHUSETTS

# Appointments and Promotions

**H. Merrill Bowman** has been promoted to asst. divisional sales manager for power transmission equipment, for Link-Belt Co., with headquarters at the company's Pershing Road plant in Chicago. Also announced is the appointment of **Eugene S. Bogart** as district sales manager at Baltimore, to succeed Mr. Bowman.



H. M. Bowman



E. S. Bogart

• • •

Ampeco Metal, Inc., Milwaukee 4, Wis., has announced the following sales changes: **Jack K. Bybee** has been appointed district manager of the Detroit Sales territory. He will be assisted by **Don Coleman**, field engineer.

**Gordon E. Brown** has been appointed district manager of the Chicago sales territory. He will be assisted by **Robert H. Louthain**, field engineer.

**Tom Coghill**, has been appointed development engineer-Process Industries with headquarters in the Chicago office of Ampeco.

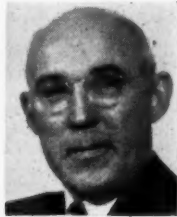
**James F. Lincoln**, president of the Lincoln Electric Co., Cleveland, announces the appointment of **G. F. Clipsham** to the position of assistant to the president.

**Paul E. Lundquist** has joined the Thomas Machine Mfg. Co. of Pittsburgh as sales engineer and special field representative.

Adamas Carbide Corp., 40-30 - 23rd St., Long Island City, N. Y., announces the appointment of **Albert J. Fischer** as head of Product Research and Development Laboratory.



Albert J. Fischer



James L. Byrom

• • •

**James L. Byrom** has been appointed manager of the Chandler-Evans Div. of Niles-Bement-Pond Co., West Hartford 1, Conn.

**John S. Madden** is the new sales engineer and assistant electrical engineer of the G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio.

**Norman B. Johnson**, assistant executive vice president of Pullman Standard Car Mfg. Co., Chicago, will head all activities of Pullman Car Works, Chicago passenger car division.

Three new offices have been added to The Louis Allis Co., Milwaukee 7, Wis.: vice president in Charge of Sales, **Louis Allis, Jr.**; vice president in Charge of Manufacturing, **Frank O. Kovich**; and vice president in Charge of Engineering, **T. R. Wieseman**.

Also appointed were **C. G. Skidmore**, sales manager, **James H. Daganhardt**, chief engineer, and **John J. Kirkish**, chief of Electrical Design.

The Timken Roller Bearing Co. Canton, 6, Ohio, announces five Bearing Division organizational changes:

**Blair Glenn**, assistant factory manager of the Canton Bearing Division; **Henry Tobey**, general superintendent of the Canton Bearing Factory; **Fred Barnard**, Canton Bearing Factory metallurgist; **Joseph Selby** assistant Canton Bearing Factory Metallurgist; **Russell P. Fowler**, superintendent of the Bucyrus Bearing Factory.

**Henry F. Kalweit**, is the new president of The Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn. Other management changes include **William G. Schultz**, vice president in charge of sales and the machinery division, and **Frank B. Laurich**, vice president in charge of the wheel division.

**John I. Snyder, Jr.**, chairman of the board of Pressed Steel Car Company, Inc., N. Y., has been elected president of the company.

**Maurice Stanley**, president of The Fafnir Bearing Co., New Britain, Conn., during the past 21 years, was elected chairman of the board, and executive vice-president **Stanley M. Cooper** was named president.



Maurice Stanley



Stanley M. Cooper

The Hettrick Mfg. Company, Toledo, Ohio, have chosen **I. P. Smith**, chairman of the Board.

The Bellows Co., Akron, Ohio, has announced realignment of sales territory into five regional sales divisions, Eastern, Midwestern, Central, Southern and Western. First of the regional sales manager appointments is **Harold P. Granger**, to head the Eastern division, with offices in Boston.

The Black & Decker Mfg. Co., Towson, Md., has announced the following sales organization changes: **G. M. Buchanan** in charge of a new branch at Charlotte, N. C.; **J. P. Spain**, branch manager Baltimore; **Arthur S. Boehm**, branch manager of San Francisco.

**Gerard J. Carney** has been appointed sales manager of The Special Products Division of Lodge & Shipley Company, Cincinnati.

**Joseph R. Lex** has been appointed assistant general manager of Progressive Welder Co., 3050 E. Outer Dr., Detroit.

Appointment of **Theodore I. Leston** as vice president in charge of production, Eutectic Welding Alloys Corporation, was announced by Eutectic Welding Alloys Corp., 40 Worth St., N. Y. 13.

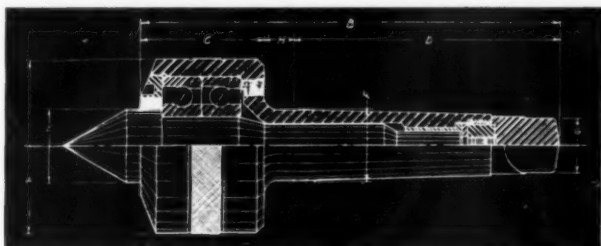


Theodore I. Leston



I. J. Barber

**I. J. Barber**, director of engineering for the Fostoria Pressed Steel Corp., Fostoria, Ohio has been promoted to a vice president.



## ROOFE STANDARD LIVE CENTERS

**A quality product**

Strong, Rigid, Accurate over long periods of use. Rough and finish turn and thread without chattering. 1000 to 6000 pounds thrust load for any type of work.

Satisfied customers in U. S. and foreign countries evinced by repeat orders.

Write for descriptive catalog. Reliable distributors wanted.

**ROOFE MACHINE WORKS, Inc.**

5415 Harrisburg Blvd.  
Houston 11, Texas

# Air-O-chek Air Guns

**SPEED PRODUCTION**

**STOP-LEAKS**

**SAVE TIME**



In thousands of leading factories, machine shops, foundries, etc., Air-O-chek Air Guns are saving air, speeding production, reducing maintenance. There are many reasons. Simple construction. The exclusive ball and socket joint between valve and enclosed lever which gives full discharge with slight flex of hose. Instant, positive shut-off. No outside levers or buttons. No packing gland. Just install a dozen Air-O-cheks and compare results.

**AIR-WAY PUMP & EQUIP. CO., 1054 N. Kilbourn, Chicago 7, Ill.**

The E. Horton & Son Co. Windsor Locks, Conn., have elected the following directors: **Donald B. Hunting**, **Douglas H. Thomson, Jr.**, **Mary A. Caffrey**, **H. Bissell Carey, Jr.**, and **Paul W. Adams**. The board of Directors has elected **Mr. Hunting** president, **Mr. Thomson**, vice-president and treasurer, and **Miss Caffrey**, secretary.

**John A. Hutcheson** has been appointed director of the Westinghouse Research Laboratories, Pittsburgh 30, Pa.

**A. L. Gutterson**, **J. B. Johnson** and **C. N. Safford** were elected directors at the regular stockholders' meeting of Lovejoy Tool Company, Inc., Springfield, Vermont. **C. N. Safford** was also elected president and **C. E. Hopkins**, treasurer of the corporation.

**John J. Hart, Jr.**, has been named sales manager of a recently formed division of the Watson-Standard Co., Pittsburgh, Pa.

The following are changes in personnel at Allis-Chalmers, Milwaukee, Wis.: **James M. Barker**, board of directors; **E. H. Horstman** and **Hans P. Dahlstrand**, chief engineer and director of engineering of the steam turbine department; **George H. Carden** and **T. G. Smith**, manager of Baltimore district office and resident representative at Beaumont, Tex.; **John R. Queen**, dealer supervisor at New York; **A. F. Rolf**, assistant secretary, retired; **James Wilson**, manager of the field engineering section, retired.

Wheelco Instruments Company, Chicago, announce the appointment of **J. P. Cantor** as district manager of the new Cleveland District Office located at 4501 Prospect Ave.

**Herbert Proske** has been promoted to assistant district manager of the New York office.

The Washington D.C. office has been moved to new quarters at 2285 Rhode Island Ave. **Robert Smith** is in charge.

## NEW POR-MATIC

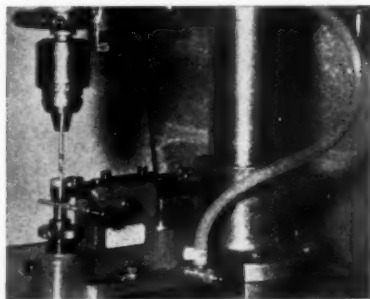
AIR-OPERATED

## DRILLING FIXTURE

• This new POR-MATIC air-operated Universal drilling fixture is rigid, sturdy and machined to exact tolerances. It will handle round stock 1/16" to 1" and by using a special upper beam or drill bushing carrier 1 1/2" can be received for cross drilling. This fixture can be mounted on any of the regular bench type or floor type drill presses in a matter of minutes. Depending on type of material and diameter of hole size, it will increase production from 33% to 200%.

Price \$75.00 Air Regulator Extra \$8.35

Send for literature giving complete description.



Patent Pending

# THE PORTER MACHINE CO.

3100 ENYART AVE

CINCINNATI 9, OHIO

Clearing Machine Corp., Chicago, announces the appointment of **E. P. Cunningham** as divisional sales manager of their Detroit office, at 7-232 General Motors Bldg., Detroit 2, Mich.



**E. P. Cunningham**



**Andrew A. Priest**

Thomas A. Edison, Inc., Instrument Division, West Orange, N. J., announced the appointment of **Andrew A. Priest** as factory manager.

**F. C. Ritner**, has been promoted to vice president in charge of Personnel, Carboloy Co., Inc., Detroit 32, Mich.



**F. C. Ritner**



**Arthur S. Roberts**

Appointment of **Arthur S. Roberts** as secretary and counsel of SKF Industries, Inc., Philadelphia 32, Pa., has been announced by **William L. Batt**, president.

Also announced is the appointment of **Charles J. Reimer** as general purchasing agent.

**CASE REPORT No. 48** from a series of actual cases recording the successful application of **BEAR DY-NAMIC BALANCING** to industry.

## Electric Tool Manufacturer Adds Years To Life Of His Products Through Dy-Namic Balancing

Because Bear Dy-Namic Balancing makes for a smooth and more quietly-operating rotating assembly, free from friction and vibration, it adds years to the life of the finished product. This has been proven again and again by U.S. Electrical Tool Co. and hundreds of other manufacturers who have Bear-Balanced rotating parts weighing from 4 oz. to 8 tons. An operation similar to yours is most likely represented in our Case Report file. Write for particulars, as well as a copy of the latest Bear Industrial Balancing Catalog. Bear Mfg. Co., Dept. M-20, Rock Island, Ill.

2655 MT

United States Electrical Tool Co., Chicago, has been Bear-Balancing fans, armatures and fan armature assemblies for five years. Daily balancing operations number from 95 to 135, require from 3 to 5½ minutes each.



**BEAR** STATIC AND  
DY-NAMIC BALANCING MACHINES





# News of the ..... industry.....

## 16TH ANNUAL A.S.T.E. MEETING AND INDUSTRIAL EXPOSITION AT CLEVELAND

The 16th annual meeting of the American Society of Tool Engineers, held at the Public Auditorium in Cleveland, March 15-19, was considered one of the organization's most successful functions in recent years. The occasion was highlighted by the excellent address delivered at the annual banquet, by James D. Mooney, president and chairman of the board of Willys-Overland Motors.

Three technical sessions, devoted to subjects of general interest to the delegates, were held coincident to the meeting and exposition. The seminars were limited to three, since too many would have tended to counteract the interest in the Exposition itself. Subjects included: "Work Handling Simplification," "Dies . . . Control of Deep Draws and Irregular Shapes," and a novelty developed by the Program Committee entitled "The Tool Engineers Quiz", consisting of a series of 25 questions selected from those submitted by the society's more than 18,000 members; the answers were supplied by a panel of qualified experts.

The officers for the 1948 season were elected, as follows: Irwin F. Holland, who served as first vice president and a Board Member in 1947, president. Mr. Holland is general superintendent of the Small Tool & Gauge Dept. of Pratt & Whitney Div. of Niles-Bement-

Pond Co., West Hartford, Conn. Robert B. Douglas of Montreal, first vice president; he is president of Godscroft Industries Ltd., Montreal Que., and a charter member of the Montreal chapter of the A. S. T. E.

The second vice president for 1948 is Herbert L. Tigges, vice president of Baker Bros., Inc., Toledo; third vice president, V. H. Ericson, of Worcester, Mass., vice-president of Johnson de Vou, Inc., Treasurer is George A. Goodwin, chief process engineer at Master Electric Co., Dayton. The new secretary, William B. McClellan, is sales engineer for the Gairing Tool Co., Detroit.

Three new members were elected to the Board of Directors: J. J. Demuth, St. Louis; Robert W. Ford, Pittsburgh; and Henry J. Richards, Boston. Incumbent directors reelected were Karl L. Bues, H. E. Collins, Grant S. Wilcox, T. J. Donovan Jr., Robert B. Douglas, Irwin F. Holland, and Herbert L. Tigges. W. B. Peirce retiring president, automatically becomes the eleventh member of the Board of Directors.

The editors wish to bring to your attention that the host of new products which were exhibited at the Exposition held in conjunction with the A. S. T. E. meeting, are not being



reviewed in this issue of the Machine and Tool Blue Book. Lack of sufficient space precludes giving more than a few lines of space to the varied and colorful exhibits; we feel that a mere few lines devoted to each exhibitor would be even less satisfactory than no mention at all. However, from time to time, descriptions of some of the most important and significant units will be described in detail.

The exhibits featured at the Tool Engineers' Industrial Exposition covered a comprehensive range of the latest developments in the American industrial field, from materials handling equipment to measuring devices and special units for the production of parts for progression tools. Up-to-date items in the field of carbides, cutting and milling devices, indexing tables, and other similar developments caused interested comment. The Exposition was well attended some 30,000 persons having filed through the turnstiles. Numerous foreign and Canadian visitors were present. The special side tours to plants in the Cleveland area were especially well attended, some 2500 visitors having made their way to these companies.

#### **PRATT & WHITNEY PURCHASES POTTER & JOHNSON ASSETS**

Jacob Ziskind, president of Potter & Johnston Machine Co., Pawtucket, R. I. advises that the Pratt & Whitney Division of Niles-Bement-Pond Co. of West Hartford, Conn., has purchased the good will, patents, patterns, jigs, fixtures, drawings, and all the work in process inventory of Potter & Johnston. The plant and manufacturing equipment will still remain under the ownership of the old company, which will be known as Darlington Industrial Corp. Pratt & Whitney Company have leased the plant for a term of years and will carry on operations at Pawtucket.

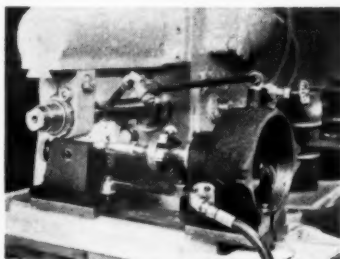
J. Earle Makant, in charge of plant operations, J. Potter Cunningham, in charge of sales, and Carl A. G. Birkedal, in charge of accounting, will become associated with the Pratt & Whitney Division and will continue to function

along the same lines as with the predecessor company.

Norman R. Earle, who was executive vice-president of the Potter & Johnston Machine Co. will be executive vice-president of Darlington Industrial Corp. and Jacob Ziskind will be president and treasurer.

#### **PNEUMATICS INCORPORATED TAKES OVER ANKER HOLTH MANUFACTURING CO.**

Jay Creswell, president of Pneumatics Incorporated, Plymouth, Ind., purchased all of the common stock of the Anker Holth Manufacturing Co. Port Huron, Mich., from Mrs. Lillian Birkenstein and her affiliates, on March 20, 1948. All of the present agents and distributors of the present organizations will be retained. Mr. Creswell has been manufacturing air cylinders and air valves at his Plymouth plant; the acquisition of the Anker Holth Manufacturing Co. will add hydraulic cylinders and mill cylinders and chucks to the company line.



Get the facts about the Automatic Erickson Speed Indexer for milling operations requiring regular spacing. Indexer may be connected to be fully automatic. New Speeds — new savings — new profits. Ask for Bulletin "T-5".

**ERICKSON TOOLS DIVISION**  
2301 Hamilton Ave., Cleveland 14, Ohio

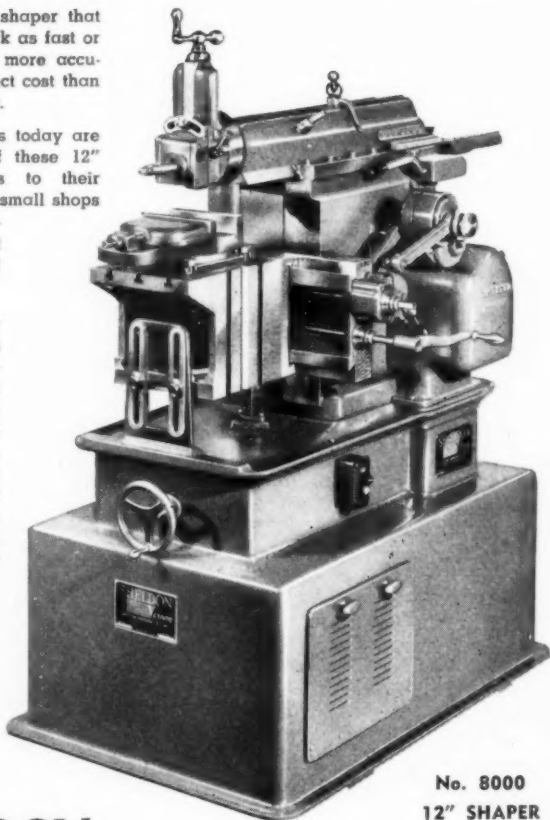
# The right size for most shops...

Here is an inexpensive shaper that will do most of your work as fast or faster, as accurately or more accurately, and at lower direct cost than large expensive shapers.

That is why many shops today are adding one or more of these 12" Sheldon-Vernon shapers to their present equipment, why small shops and maintenance departments have selected it as their logical first shaper.

Modern design and new manufacturing methods have given this 12" Precision Sheldon-Vernon Shaper not only more operating convenience and features, but actually greater precision and longer life per dollar. It will quickly pay off its entire cost and give added years of highly profitable service.

*Write for "12 inch Shaper Bulletin;" or better still, ask your local Sheldon dealer to demonstrate.*



No. 8000  
12" SHAPER

**SHELDON**  
*Vernon*

## SHELDON MACHINE CO. Inc.

*Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers*  
4242 N. KNOX AVENUE • CHICAGO 41, ILLINOIS. U. S. A.

# WHAT'S NEW IN METALWORKING

## HEAVY DUTY SQUARING SHEARS HAVE $\frac{5}{8}$ " CAPACITY

A new addition to its line of Heavy Duty Underneath Drive Squaring Shears has just been completed by the Niagara Machine and Tool Works. Its rated capacity is  $\frac{5}{8}$ " mild steel, 14 ft. long and the Model is designated as the No. 1214.

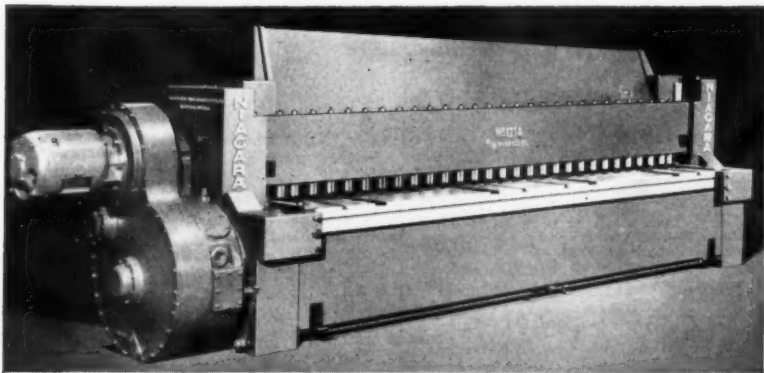
In common with other Niagara Power Shears, it has a rectangular box section bed and triangular box section cross head to give rigid support to the knives. This rigidity, together with the low slope of the upper knife, greatly reduces the tendency for the sheared pieces to twist, curl or camber.

The holddown, driven by eccentrics on the heat treated crankshaft, needs no auxiliary operating mechanism. Its self-contained, individually spring loaded feet clamp the metal during the working part of the cycle and auto-

matically compensate for variation in metal thickness.

All rotating parts, including Niagara 14-point engagement sleeve clutch, heat treated gearing and the connections, are totally enclosed and operate in an oil bath. This construction provides increased safety for the operator and adds to the life of the machine. The parallel ball bearing self-measuring back gage can be arranged for either manual or electric operation. When motor driven, it is equipped with a direct reading indicator located in the crosshead. The "Wide" and "Narrow" push buttons are located on the frame in a position convenient to the operator. Specifications are available by writing:

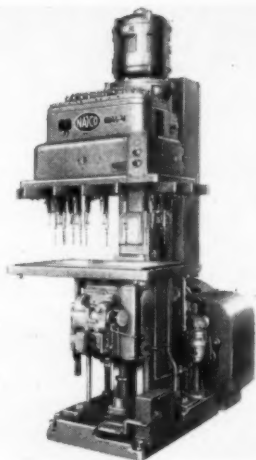
Niagara Machine and Tool Works  
Dept. BB  
Buffalo 11, N. Y.



## NATIONAL AUTOMATIC INTRODUCES NEW PRODUCTION MULTI-SPINDLE DRILLS

A new line of high speed, sensitive multi-drillers and tappers for a wide range of production operations is announced. These units consist of both Heavy and Light Duty, Model H-5 and H-6 Multi-spindle drillers. The machines are of similar design, and vary only in the size of the drilling area of the head, horsepower of the head drive motor, number of spindles in the head, and the work table size. They will handle a wide range of small and medium-sized work, and facilitate the multiple drilling or tapping of small holes.

These machines may be furnished as a Driller only, as a Tapper only, or as a combination of both units. They are provided with quick change speed mechanism for adjustment of correct spindle speeds. A vertical adjustment on the spindles compensates for the grinding of drills, or the use of different length drills, and a feature in the spindle design permits float for tapping operations. Both units are equipped with a reversing motor drive.



A table is provided which may be arranged with either a combination hand and foot feed, or a hydraulic power-operated feed (see picture). All electrical equipment is enclosed, and all unnecessary movements on the part of the operator have been eliminated, allowing faster operation.

The Model H-5 may be furnished with a 7" x 12" drilling area head, and is provided with twelve 3/4" dia. upper joint drives. The Model H-6 may be equipped with a 10" x 24" drilling area, with twenty-four 3/4" dia. drives. Both heads are provided with anti-friction bearings, and are equipped with the independent change of spindle speeds which provide two speeds and neutral for each spindle.

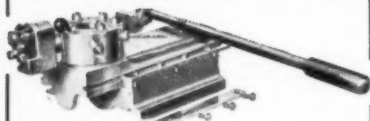
For complete and detailed information on these new units, write:

**National Automatic Tool Co., Inc.,  
Dept. 24-BB  
Richmond, Ind.**

### HARD, DRY RUSTPROOF COATING

A new rust preventive by which a thin, clear film is deposited on metal surface, has been developed. Called Kano Rustproof, it is applied cold by

## MORE PROFITS FROM YOUR LATHE



### STEP UP PRODUCTION

**I** NSTALL a Newton Precision Bed Turret for maximum tooling on your Logan, Atlas or Craftsman Lathe. This self-indexing, self-head-locking turret accommodates six tool positions. Adjustable gibs assure long-life and precision operation. Fast—smooth—easy to operate. Get greater production now. — Write for free literature now. Dept. MT-4.

**PRICE  
\$150.00  
F.O.B.  
Los Angeles**

### A-K TOOL COMPANY

**2029 Blake Avenue, Los Angeles, Calif.**

dipping, spraying or brushing; it dries in about 15 minutes to a clear, hard surface. It is flexible and non-porous, and has the capacity of creeping under, and displacing moisture avoiding the spotty rust on polished surfaces, due to handling.

Kano Rustproof may be removed with any petroleum solvent, although it is not necessary to remove it prior to painting. The film becomes so hard that it can be applied to hand tools, on which it acts as an excellent rust preventive. It is also suitable for preventing corrosion on raw stocks and on finished parts.

**Kano Laboratories, Dept. BB**  
75 East Wacker Drive  
Chicago 1, Ill.

#### **WHITLEY PRODUCTION PRESS RATED AT 4-TON CAPACITY**

The Whitley Model No. 12 Production Press features a positioning rod and clutch mechanism. The rod serves to position the rack, to operate the press manually, and to engage and disengage



the clutch without the aid of additional levers. The rod is equipped with a milled groove which allows the clutch release lever pin to follow the contour of the groove engaging the plunger pin into the clutch plate.

The press is rated at 4-ton capacity. Due to the sensitive action of the clutch mechanism, very slight pedal pressure is necessary to complete the operation desired. When the clutch is engaged, the maximum pressure attained is held until the clutch is disengaged by turning the positioning rod. The press was designed to eliminate tearing and scoring of highly finished parts. If any piece being pressed in is tilted to any degree, it has the same effect as an oversized tolerance. This discrepancy can be detected at once, and adjusted to eliminate production spoilage. Any pressure required above the pounds pressure means improper tolerances equal to drive fits rather than press fit.

Dimensions of the No. 12 include a floor space of 20-3/4" x 19"; height, 53-1/2". Special set-ups required for this unit will be engineered at minimum cost.

**Whitley Engineering Co., Inc.,**  
Dept BB, 3210 Durand Road  
Racine, Wis.

## **LUCIFER**

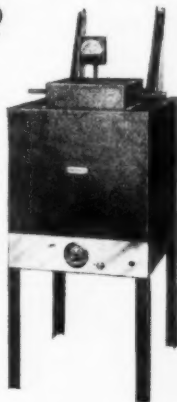
### *Electric* **Salt Furnace**

Featuring square pot size 8" wide, 8" long and 10" deep.

Price \$350.00. F.O.B. Plant, Phila., complete with pyrometer, thermocouple, switches and automatic electric control.

Temperatures to 1850° F.

We also manufacture muffle furnaces.



Send for free literature  
Some territories open for distributors.

**GILBERT S. SIMONSKI**  
403 N. Broad St. Philadelphia 8, Pa.

These efficient tool kits speed up your counterboring and spot-facing work, by putting a wide range of cutter and pilot combinations within easy reach. Seven sets from which to choose.

## COUNTERBORE SETS

*Write for Folder and Prices*

### THE GAIRING TOOL CO.

Roosevelt Park Box 478, Detroit 32, Mich.



This set includes: one type A-1 holder; nine cutters from  $\frac{1}{4}$ " to  $\frac{1}{2}$ "; eight pilots from  $\frac{3}{16}$ " to  $\frac{3}{8}$ "; two  $\frac{1}{2}$ " countersinks, one 70° and one 82°, in hardwood box with hinged cover.



## NOPAK SPEED CONTROL VALVE

The new, compact, Nopak Flo-Trol Speed Control Valve, pictured below, is rapidly and accurately adjusted; it requires no tools, since the adjusting sleeve is easily turned and set by hand.



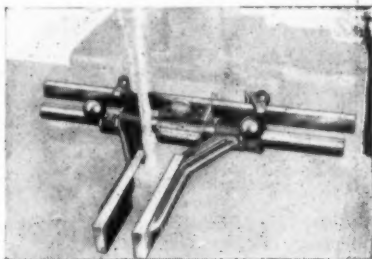
The Flo-Trol Valve also permits a wide range of adjustment. When wide open, it has six times the capacity of conventional valves. The unit has many times the "seating area" usually found in valves of this type. Built almost entirely of brass, it is virtually rust-and-corrosion proof.

The Nopak Flo-Trol can be inserted at practically any point in an air or hydraulic line. Its small size and compact design result in effective, convenient installation in tight corners, or in limited space. It may be removed or replaced any time without disturbing the piping. For complete information, write:

**The Galland-Henning Mfg. Co.**  
Dept. BB  
Milwaukee 7, Wis.

## SAFETY WORK-HOLDER FITS BOX COLUMN DRILL PRESSES

Box column single spindle drill presses can be equipped for greater



safety with the new Model No. 8 Universal Safety Work-Holder. This new



## A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in  $\frac{1}{8}$ " to 1" diameters. Send for price list.

**HEIMANN MFG. CO.**

332 Lincoln Ave.

Urbana, Ohio

tool locks to the column dovetail with two set-screws and is fully adjustable to fit all presses of this type; it further affords a quick method of securing drill press work on tables where there is no provision for clamping with bolts. It can be kept attached to the press at all times. The unit raises and lowers with the drill press table, and locks by a quarter turn of the handles. The jaws open the full width of the bar to accommodate 11-inch work; if desired, the jaws can be instantly removed. For complete details, write:

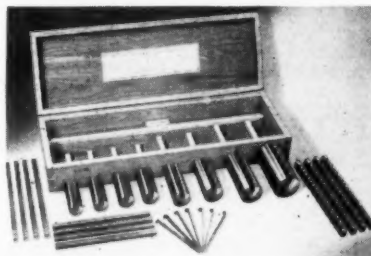
**Universal Vise & Tool Co., Dept. BB**  
Parma, Mich.

### NEW BROACH KIT CUTS ALL STANDARD KEYWAYS

The du Mont Corporation announces an addition to their line of Keyway Broach Kits for cutting all standard Keyway sizes. The Kits are available with carbon steel broaches and with high speed steel broaches. Bushings are provided for all hole sizes from 1/2" to

1 9/16" in graduations of sixteenths.

It is only necessary to drop the correct size bushing in the bore, place the broach of the desired width under the arbor press and in the bushing slot and press it through. The precise keyway depth is obtained by using shims provided in the kit.



All Kits are furnished in sturdy hardwood cases.

**The du Mont Corp., Dept. BB**  
Greenfield, Mass.

## 'STAR DUST'

### LABORATORY GRADED PURE DIAMOND POWDERS

For GAUGES, TOOLS, DIES, etc., with tremendous TIME SAVING. These factors make STAR DUST indispensable in lapping and superfinishing on HARDSTEELS, TUNGSTEN CARBIDE, CHROME.

- Absolute control of particle sizes
- STAR DUST sizes as fine as .0001"
- Complete absence of out-size particles
- Complete range of grit sizes

There is a STAR DUST Field Serviceman in your territory.

STAR DUST speeds up production enormously and produces finishes and superfinishes down to less than .0000004 of an inch.

**Precision LAPPING  
POWDERS for  
PRECISION work**



**ACE ABRASIVE LABORATORIES**

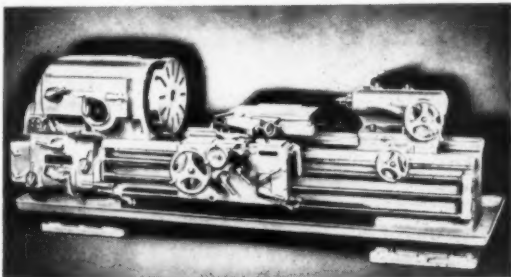
ONE SPRUCE STREET  
NEW YORK 7, N. Y.



## NEW SIDNEY LATHE HAS 48 THREAD AND FEED CHANGES

This new 25" heavy-duty engine lathe features a 16-speed, dial controlled, all herringbone geared headstock. Spindle and intermediate shafts are supported by center bearings in addition to the conventional end bearing supports. Rotary pump and filter provide automatic lubrication to all bearings and moving parts.

The Gear box provides forty-eight changes of threads from  $3/4$  to 46 and forty-eight changes of feeds from .003 to .207" per revolution of the spindle. Closed exterior design of the gear box unit prevents dirt and chips from entering. The lathe bed is provided with four longitudinal walls and double cross girts for rigidity. Hardened and ground tool steel bed



ways are provided when ordered.

Apron is of double wall construction with all shafts rotating on anti-friction bearings. Built-in oil pump and filter provide lubrication to all moving parts and also lubricate the bed ways and cross slide. For the operator's convenience, the tailstock handwheel is mounted on the side and a gear reduction unit

## NEW SOLDER REPLACES LITHARGE AND GLYCERINE

Cerroseal-35 produces seal between glass dome and metal fitting in this Absolute Pressure Gauge operating under 15 pounds differential pressure with the following advantages over litharge and glycerine seal:

1. Does not pull loose under vibration.
2. Not dissolved out by various vapors to which subjected in use.
3. Leak tight joint obtained immediately upon setting.
4. Dome breakage eliminated.
5. Less skill required for assembly.

Cerroseal-35 adheres directly to clean smooth glass, mica and most ceramics. Bonds to most metals like ordinary solders. Low working temperature — approximately 260° F. makes it an ideal hermetic seal for glass dial covers on delicate instruments and many other applications.

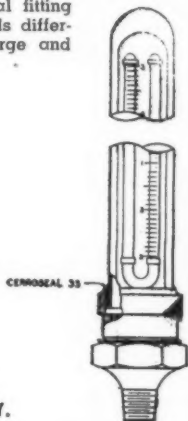
Write for instruction sheet and working sample.

### CERRO DE PASCO COPPER CORP.

Dept. T

40 Wall Street

New York 5, N. Y.



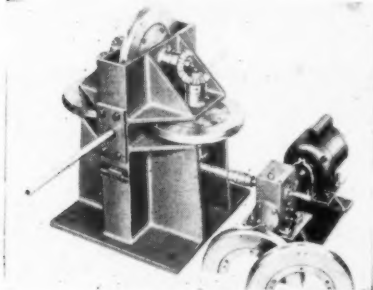


is provided to position the tailstock along the bed. For complete specifications, write:

**The Sidney Machine Tool Co.**  
Dept. BB,  
Sidney, Ohio

#### HIGH-SPEED DEVICE FOR STAMPING SEAMLESS TUBING

Manufacturers of seamless and light-wall aluminum, copper and brass tubing, can now mark up to four sides of these products at high speed with this new marking device. The Pannier "Master Marker" Universal Marking Machine stamps 1, 2, 3, or 4 sides on the same run at a rate up to 300 f. p. m. It handles bars as well as tubing, in round, square, hexagon, and other shapes, in sizes from 3/8 to 2-inch diameter. Either portable or stationary, and equipped with a 1/3 h. p. motor, the unit can be used for production



line or job work. It has replaceable segments, and interchangeable type, if required. The character size depends on the requirements of the product marked.

Originally developed to mark mechanical tubing for electrical use, its stamping characteristics meet Underwriters' Laboratories specifications. Bulletin LTM-1, giving complete specifications, is available upon request from:

**Pannier Bros. Stamp Co., Dept. BB**  
203 Pannier Bldg.  
Pittsburgh 12, Pa.

#### PORTABLE ELEVATING TABLE



**Saves  
TIME  
and  
LABOR**

- Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15 1/2", leaving operator's hands free. Table swivels and locks in any position.

SEND TODAY FOR ILLUSTRATED CATALOG NO. 2

**MIDWEST TOOL & ENG. CO.**  
112 WEBSTER ST., DAYTON, OHIO

**WHITNEY-JENSEN PRODUCTS**  
38 YEARS EXPERIENCE

**Nos. 10-11-12**



#### BALL BEARING PUNCHES

CAPACITY — 3/8" THRU 1/4"

PUNCHES and DIES  
3/32" THRU 1/2" BY 1/64" VARIATION  
HANDY FOR MAINTENANCE

*Write for Literature*

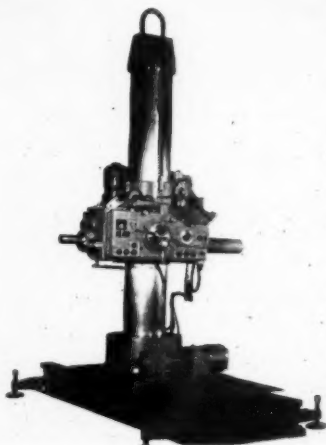
**WHITNEY METAL TOOL COMPANY**  
115 FORBES ST. \* ROCKFORD, ILL.

## KAUKAUNA DRILLING AND TAPPING MACHINE VERSATILE, COMPACT

New Kaukauna portable horizontal drilling and tapping machine No. 1030, has a tilting horizontal head for an unlimited number of drilling and tapping operations. The compactness and portability of the machine afford an easy approach to the work, simplifying difficult machining operations. Full three dimensional power traverse and swiveling of the headstock for drilling and tapping operations throughout the range of  $45^\circ$ , above or below the horizontal spindle position. The machine spindle can be placed in virtually any position for drilling and tapping through (1) the power elevation of headstock on column; (2) the column and sub-base power traverse on the runway; (3) the tilting of the headstock  $45^\circ$  above and below the horizontal; and (4) the rotation of the column  $360^\circ$  on its sub-base.

Other features include: fine feed to spindle through micrometer handwheel; adjustable calibrated depth gauge with automatic trip throws out feed at any predetermined depth within 6" of spindle travel, the starting point being anywhere within the total spindle traverse; single lever control for three feeds; rotary selector lever with indicating dial for speed changes; automatic tapping device with adjustable dial for tapping to a depth of 5" and others.

Model No. 1030 has a capacity of 3"



in cast iron with a 3" diameter spindle, 9 spindle speeds, 3 spindle feeds, and a 24" longitudinal continuous travel of spindle and a 48" horizontal travel of column on runway. Bulletin and specifications obtainable from:

**The Kaukauna Machine Corp.**  
Dept. BB. Kaukauna, Wis.

## NEW PUSH BROACH HAS HIGH ACCURACY

The Horton Kee-Way Broach has been developed to eliminate one of the most troublesome jobs encountered in the average machine shop and tool room. To cut keyways in cams, gears, sprockets, pulleys, rocker arms and irregularly shaped parts has formerly been a time-consuming process involving the use of special fixtures and skilled mechanics. The Horton Kee-Way Broach is the answer to this problem.

It is simple, sturdy push broach, consisting of a hardened and ground body,

slotted for a high speed steel blade held firmly in place by a heavy locking nut. The broach is positive in action and needs no adjustment. Every keyway that is cut is absolutely central with the hole, square, and to the exact width and depth. This inherent accuracy is built into the tool and no special skill is needed to use it. All sizes of broaches can be arranged to cut double or feather keyways.

The number of passes that must be taken to finish the keyway varies with the size of the bore. The slots in the

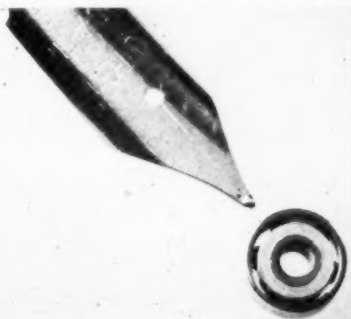
broach body are numbered; the first pass is made with blade in No. 1 slot, the second one with the blade in No. 2 slot, and so on. It takes only a few seconds to change the blade from one slot to the other. The depth of the slots has been engineered so that keyways up to  $\frac{1}{2}$ " wide can be made using a standard hand operated arbor press. For complete details:

**The Sloan Machine Co., Dept. BB**  
18725 St Clair Ave.  
Cleveland 10, Ohio

#### **SMALLEST GROUND BEARING HAS SOLID BRONZE RETAINER**

Successful production of the smallest ground angular-contact (radial-thrust) ball bearing in the United States is announced. This rugged little ball bearing is of advanced design, with a machined, solid bronze retainer carried by the ground lands of the inner ring. Dimensions are 5/64" bore x 1/4" o. d. x 3/32" wide, to ABEC tolerances 1 and 5.

The operation is reported to be exceptionally smooth at low as well as extra-high speeds. The usual application is in opposed pairs, in which case both axial and radial play may be reduced to zero, with preloading to suit.



Further details on request.  
**New Hampshire Ball Bearings, Inc.,**  
Dept. BB  
Peterborough 1, N. H.

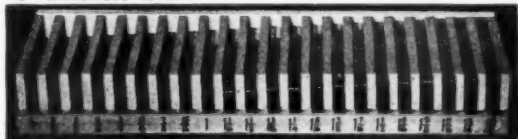
## **ANTON PARALLELS**

#### **INCREASE PRODUCTION**

ANTON PARALLELS FILL A LONG-FELT NEED — permanently straight and accurate, yet priced for every-day general machine shop use.

**ALL PARALLELS FULLY GUARANTEED** — To be within the Limits Specified.  
**MAXIMUM SIZE TOLERANCE .001 INCH ON GROUND SIDES** — Maximum Variation in Parallelism and Straightness within Length, .0001.  
**ROCKWELL "C" HARDNESS 65 UP.**

#### **IMPROVE QUALITY**



ANTON PARALLELS COME IN 79 STANDARD SIZES

- $\frac{1}{4}$ " Thick x 6" Long —  $\frac{1}{8}$ " to  $1\frac{1}{2}$ " High in Steps of  $\frac{1}{16}$ " .....\$96.00 per set — 22 pairs.
- $\frac{1}{2}$ " Thick x 6" Long —  $\frac{1}{4}$ " to  $1\frac{1}{2}$ " High in Steps of  $\frac{1}{16}$ " .....\$71.00 per set — 11 pairs.
- $\frac{3}{4}$ " Thick x 6" Long —  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " High in Steps of  $\frac{1}{16}$ " .....\$68.75 per set — 11 pairs.

Large Stock of Single Pairs also Available

All Prices are F.O.B. New York

## **ANTON MACHINE WORKS**

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**EASTERN TOOL & MACHINE CO.**  
170 BROADWAY, NEW YORK 7, N. Y.  
National Representatives  
Except Illinois, Iowa, Wisconsin  
Indiana and Michigan

**TOOLS KILL CO.**  
55 E. WASHINGTON ST., CHICAGO 2, ILL.  
Representatives for  
Illinois, Iowa, Wisconsin  
Indiana and Michigan

# WILLEY'S NEW AXIAL FACE MILL



The longer runs between grinds . . . the increased production rate . . . the economy of the long life of the solid carbide blade . . . the familiar simplicity of the high speed technique in the grinding of the blades . . . are all embodied in THE WILLEY AXIAL Face Mill . . . the face mill designed for cast iron milling.

Write for Bulletin FM-90

## WILLEY'S CARBIDE TOOL CO.

SOLE MAKERS OF WILLEY'S METAL

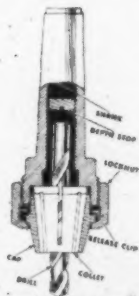
1342 W. Vernor Highway

Detroit 1, Michigan

### DREWCO CHUCK STRESSES PARALLEL ACCURACY

The principle of the Drewco Precision Chuck is based upon the idea that collet alignment and collet centering must be separate functions. A taper, necessary for collapsing the collet, should not be required for accuracy, since even the most precise manufacturing, adapted to matching tapers of collet and shank in the usual chuck, will not compensate for the small amounts of taper present on the finest cutting tool shanks.

The cross-sectional drawing below indicates how the Drewco design fills this need. At the large end of the collet taper is a transverse face, ground square with the axis which seats against the inner shoulder of the shank recess, which, being square with the shank axis, results in parallel alignment of the collet and shank. The cap is placed on the collet and pushed into the recess, automatically and positively centering the collet. The locknut causes the collapsing collet to grip the tool shank



with a powerful, even pressure. The cap itself is made so that enough elasticity is present to compensate for a considerable amount of taper on the tool shank being gripped. Since the

collet is almost completely surrounded by the cap, this assures a minimum of distortion error owing to twist in the collet itself.

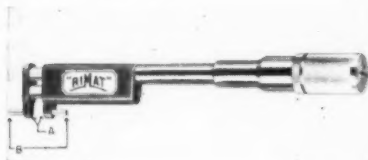
Machinists can be assured of a collet collapsibility of at least .035"; one collet will replace several standard, single-purpose collets. Odd size tool shanks will no longer require special collets. For complete details, write for bulletin.

**Drewco Corp., Dept. BB**  
1600 Junction Ave.  
Racine, Wis.

#### MICROMETER TAKES INSIDE BORE MEASUREMENTS

The new "Model L" Longitudinal Duplex Micrometer has been added to the Rimat line of measuring devices. The instrument is designed principally for inside work, to take both inside and outside measurements of grooves and flanges on the inside of a bore. It is small enough to reach into a hole or opening down to  $\frac{1}{2}$ ". Measurements are readable while the instrument is held in place, thus preventing any possibility of error.

External measurements are made between points "A" in the picture below; internal measurements are made between points "B".



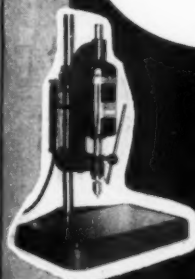
These instruments are constructed of the finest materials. Graduations are clear-cut, and the measuring pins are hardened and ground on a radius for accuracy and to prevent cramping. All the wearing surfaces are hardened and ground, and are readily adjustable if need requires. Quotations are available upon request from:

**Richards Machine Tool Co., Dept. BB**  
124 S. Isabel St.  
Glendale 5, Calif.

# Speed-Right

## for SMALL HOLE DRILLING

fast  
accurate  
PRODUCTION



easy operation

quick set-up



Speed-Right Drilling Units maintain the Right speed for faster, more accurate small hole production drilling.

Both feed and speed are quickly and fully adjustable to the exact requirements of your production drilling job when you select Speed-Right Automatic Drilling Units.

Selective Quill Feed on hand fed drill heads and drill presses assures smooth, even motion.

Write for bulletin B-202 which describes Speed-Right's five steps to lower unit cost drilling of holes .004" to  $\frac{1}{8}$ " in diameter.

THE ELECTRO-MECHANICO CO.

201 EAST ERIE STREET

MILWAUKEE 2, WIS.



## TOUGH FLOOR RESURFACER

**Makes Solid Patches  
or Complete Overlay**

Use tough RUGGEDWEAR resurfacer over wood or concrete floors. Here is a material which will stand up under the most punishing traffic conditions. Simple to install—there is no chopping or chipping required. You merely sweep out the spot to be repaired—mix the material—then trowel it on. Holds solid and tight right up to irregular edge of old concrete. RUGGEDWEAR provides a firmer, tougher, smoother, more rugged wearing surface. Used indoors or out. Dries fast.



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for

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TRIAL  
OFFER**



### FLEXROCK Co.,

3634 Filbert St., Philadelphia 4, Pa.  
Canadian Office: 21 King St., E., Toronto,  
Ont.

Please send me complete RUGGEDWEAR  
information . . . details of TRIAL ORDER  
PLAN—no obligation.

Name .....

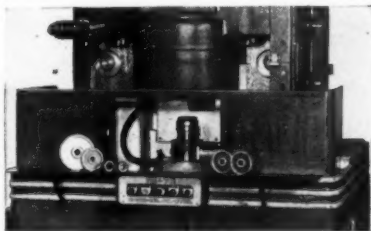
Company .....

Address .....

### SHAPERS FOR CUTTING MISCELLANEOUS FORMS

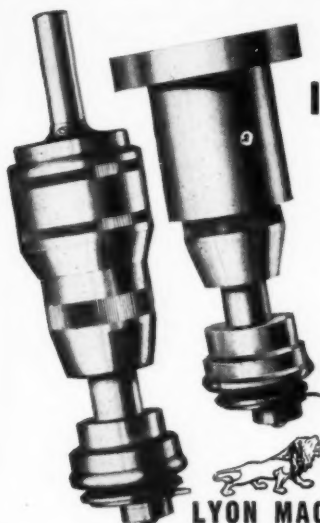
Shear-Shaped Shapers for producing other shapes than gears have been announced by Michigan Tool Co. Among the various parts which can be cut in one set-up are cams of various types, including over-running clutches; straight-sided and involute splines; toothed clutches, ratchet wheels, sprockets, and miscellaneous special forms.

The Shear-Speed machines will cut almost any external shape which can be produced internally by broaching. Shapes are cut by formed tools which feed in radially from all sides during the cut. The work is reciprocated while the tools are fed in to correct depth; tools are automatically retracted for relief on the return stroke. The complete cutting cycle time ranges from 13 to 50 seconds per piece, depending upon the material and the amount of stock to be removed.



The illustration shows some of the various shapes which may be produced with the Shear-Speed Shapers. The feed is automatically adjusted during the cutting cycle to balance the cutting load somewhat on each stroke. A fairly coarse feed is used as the tools enter the cut; the feed becomes finer as more of the cutting edge of the tools is being employed, insuring a high degree of finish. For complete details, write:

**Michigan Tool Co., Dept. BB  
7171 E. McNichols Road  
Detroit 12, Mich.**

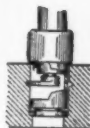


## The Lyon INTERNAL GROOVING TOOL

Its versatility saves costly preparation time — provides precision grooving of single or multiple grooves at a production rate — plus economy of set-up time — and low initial cost. The LYON has been designed for making internal grooves to tolerances of .001" using any drill press, turret lathe, radial drill or automatic equipment.

By changing only bushings and cutters within the tool model range, you have at your command a wide variety of bore sizes and shapes. A simple adjustment regulates location and depth of groove. Work cannot be scratched or marred because the head of the tool does not turn when the cutter operates.

Our Engineering Department will welcome the opportunity of discussing any grooving problem without obligation.



GROOVE  
LOCATED FROM  
BOTTOM OF  
HOLE



SINGLE GROOVE  
LOCATED FROM  
TOP OF HOLE

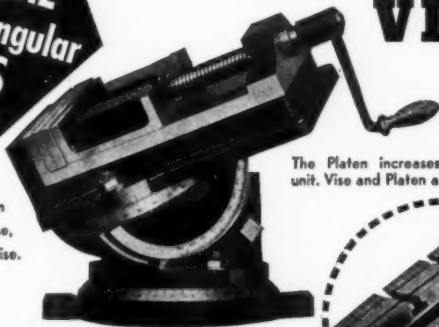
LYON MACHINE CO., WORCESTER 8, MASS.

**SAVE TIME**  
on intricate, angular  
**SET-UPS**

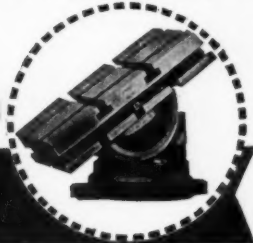
## Multi-Swivel VISE

Fully universal . . .  
three swivels simplify the  
setting of compound angles.  
Parts interchangeable . . . can  
be used as a plain flanged vise,  
a swivel vise or multi-swivel vise.

Write for  
name of  
nearest distributor



The Platen increases capacity of the unit. Vise and Platen are interchangeable.



**MASTER TOOL CO.**

161 HIGH STREET • BOSTON MASS.

**OUR  
EFFICIENT  
TOOL DESIGNING**

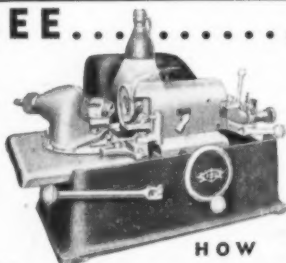
*means  
better production  
at a lower cost*

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

**COLUMBUS DIE TOOL  
and Machine Co.**

930 CLEVELAND AVE., COLUMBUS 1 OHIO

SEE.....



HOW

**VIMCOLIGHT**

contributes to accurate, fast production on this **Sioux Wet Valve Face Grinder**. Flexible arm and ball swivel joint swing high-powered light into action with simple hand adjustment. Gives searchlight clarity to important work areas and **HOLDS IT STEADY**. Streamlined, attractive and accepted as a necessity by many machine tool manufacturers.

**WRITE FOR NEW FOLDER 74.**

Ask about special offer for machine tool builders.

**VIMCO MFG. COMPANY, Inc.**

109 Brayton St.

Buffalo 13, N. Y.

**HYDRAULIC LABORATORY PRESS  
HAS 20-TON CAPACITY**

The new H-P-M Smooth-Line hydraulic laboratory press of 20 tons capacity, is designed with a double-acting ram which provides positive pull-back pressure for separating molds, dies, and similar parts. The pressing surfaces are 8", x 9"; maximum opening between surfaces is 14". Maximum travel is 8", and the maximum pullback pressure is 2½ tons. A manual operating valve controls the direction of travel. The press platen is traversed to the work by gravity; the press is equipped with a two-stage hand pump for rapid advance after contacting the work, and for rapid return.



The bed is stationary, with only the top platen traversing to and from the work. The unit is designed for accurate pressure-holding service over long periods of time. Attachments for slug briquetting, liquid extracting, compression testing, and plastics injection molding of test bars are available as optional equipment.

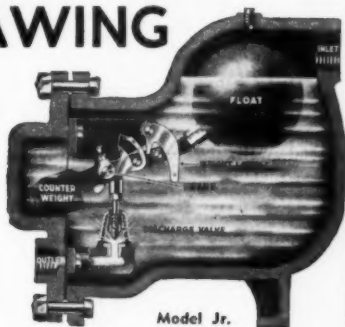
**The Hydraulic Press Mfg. Co.,  
Dept. BB  
Mount Gilead, Ohio.**



*SPEED DRAINAGE of Intercoolers,  
Aftercoolers, Receivers with Nicholson*

## NON-WIRE-DRAWING AIR TRAPS

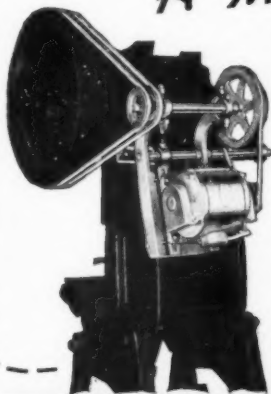
Valve opens wide instantaneously to discharge water and oil, after which it closes tight — instantaneously. Another trouble-proof feature is the positive fluid seal against loss of air. Easily connected. 3 types for every industrial application; all pressures to 1500 lbs. BULLETIN 341.



Model Jr.

**W. H. NICHOLSON & CO.** 117 Oregon St., Wilkes-Barre, Pa.

## *A Modern*



### MOTOR DRIVE FOR EVERY MACHINE TOOL

The Modern Motor Drive shown here fills an urgent demand for an easily mounted economical Punch Press Drive.

Utilizing the jackshaft principle, permitting the use of standard 1750 R.P.M. Motors.

Brackets for direct drive from motor to flywheel are also available from stock.

Write for catalog showing complete line of Modern Drives for other machine tool equipment.

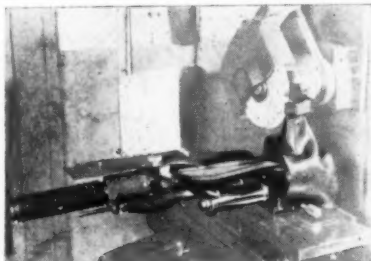
**THE NICHOLS ENGINEERING COMPANY...**  
2400 W. MADISON ST. CHICAGO 12, ILL.

## WHEEL DRESSER FINISHES CONTOURS TO .002" ACCURACY

The Hoglund Contour Wheel Dresser is high precision unit which operates on a 10 to 1 ratio from a template controlling the movements of the diamonds through a stylus. Errors in the template are reduced in a ratio of 1 to 10 through application of hydraulic principles. The limitation of the contour to size or shape is determined by the size of the diamond. If the contour can be entered with a diamond, the contour can be dressed. With the .002" radius diamond, concave radii .002" or larger can be generated.

The complete set of five diamonds contains three 60° points with .002", .005", and .010" radii, one 72° point with .015" radius, and one 90° roughing stone. The wheel to be dressed is turned with the roughing stone to within .001" to .002" of the finished contour, then a holder with a .015" radius diamond and the corresponding stylus is slipped on the dresser, and the contour is finished

in one or two passes of the diamond with only .002" of the wheel removed. Concave contours smaller than .015" radii are dressed with a diamond hav-



ing a radius small enough to enter the contour.

Hoglund Engineering Co., Inc. Dept BB  
697 Selfmaster Parkway  
Union, N. J.

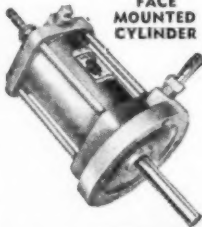
VERTICAL MOUNTING



HORIZONTAL MOUNTING



FACE MOUNTED CYLINDER

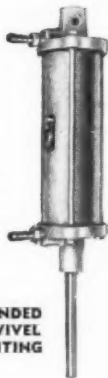


## DOUBLE-ACTION AIR CYLINDERS

Mounting	Bore				
Horizontal	1 1/2"	2 1/4"	3"	4"	5"
Vertical		2 1/4"	3"	4"	5"
Face		2 1/4"	3"	4"	5"
Swivel		2 1/4"	3"	4"	5"

Length of stroke optional

The new Mead Air Power Catalog shows the full line of single and double-acting cylinders, and air-operated Presses, Vises, Chucks, Hammers, Work Feeders—for faster, money-saving production. Write!



SUSPENDED OR SWIVEL MOUNTING

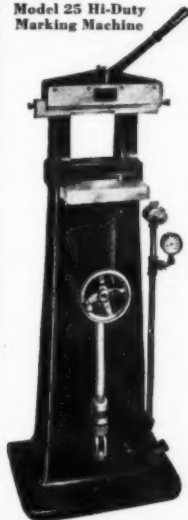


# MEAD

SPECIALTIES COMPANY

4114 No. Knox Avenue, Dept. YA-58 Chicago 41, Ill.

Model 25 Hi-Duty  
Marking Machine



## MARK YOUR PARTS

*Permanently*

PART NUMBERS  
HEAT NUMBERS

CATALOG NUMBERS  
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PATENT NUMBERS

MANUFACTURER — INSTRUCTION DATA — INSPECTION

Positive, Permanent marking on your products assist prospects to order. Makes it easier to buy—new, repeats and repairs. Gives you a definite record of pertinent data on each part produced.

The Pneumatic marking machine illustrated is our HI-DUTY model 25 general purpose tool for short runs or production work. It operates from your shop air line and is one of numerous models built to produce neat, permanent markings quickly on metal fabrications.

We will be happy to make specific recommendations upon receipt of samples or prints of parts to be marked, showing approximate lettering, its location on the part, with required hourly production.



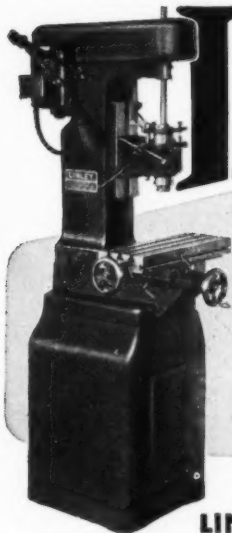
**MARKED PARTS ADVERTISE  
IN THE RIGHT PLACE, AT THE RIGHT TIME**

*Send for complete catalog of our full line  
of marking Tools, Machinery and Equipment.*

**GEO. T. SCHMIDT, Inc.**

1802 W. Belle Plaine Ave.

Chicago 13, Ill.



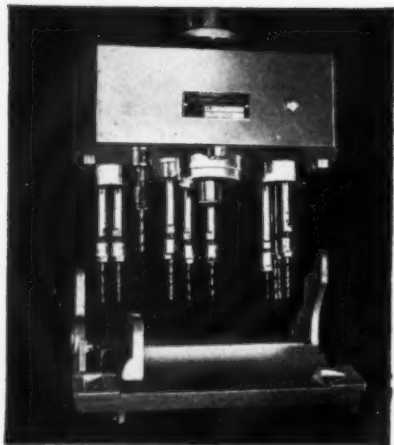
# LINLEY

**MILLER AND JIG BORER**

Handles a wide variety of tool-room jobs with speed, accuracy, efficiency... die work, jig and model making, drilling, reaming, milling. Releases larger machines for work better suited to their capacities. Easy set-up, quick changeover... velvet-smooth feed, eight spindle speeds from 275 to 4250 rpm... simple, direct micrometer setting.

**FOR COMPLETE INFORMATION,  
WRITE FOR BULLETIN.**

**LINLEY BROTHERS CO., 463 STATE ST. EXTENSION  
BRIDGEPORT 1, CONNECTICUT**



## TEN SPINDLE MULTIPLE DRILLING HEAD

Shown is a ten spindle multiple drilling head, drilling ten varied size holes on different elevations. The head has grooved thrust ball bearings at all thrust points and hardened radial bearings. Heat treated spindles and gears of one piece turned from solid bar stock. It is geared approx. 2:1. All encased in a sand cast aluminum case and cover, with alemite pressure lubrication. Send us your blueprint, sketch, or sample for a quotation.

Also:

Multiple Tapping Heads, Adj. Drilling Heads, Cone and Clutch Auto. Reverse Tapping Chucks, from No. 2 to 2" cap. Opening Die Heads, Stud Setters, and Quick Change Tool Holders.

## ERRINGTON MECHANICAL LABORATORY

CHICAGO—6701 N. SIoux AVE.

NEW YORK—170 BROADWAY

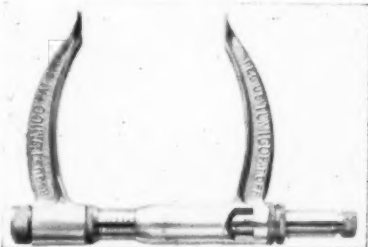
### TUMICO MICROMETER FOR GAGING MAIN BEARING JOURNALS

A new direct-reading crankshaft micrometer which enables journal diameters to be measured without removing the crankshaft from the engine block, is offered by the Tubular Micrometer Co. It is recommended for use on all types of crankshafts, but is primarily designed for combustion engines; it may also be used to advantage on compressors, pumps, and similar equipment.

The device consists of two forged steel arms with ground and lapped tips, simultaneously adjusted with a micrometer screw, accurate to .001". Its compactness simplifies measuring, especially in confined spaces. Crankshaft diameters can be determined in areas where obstructions would interfere with standard calipers.

In operation, the crankshaft micrometer is merely opened to fit over the main journal. The crankshaft sag, after bearing caps are removed, permits the

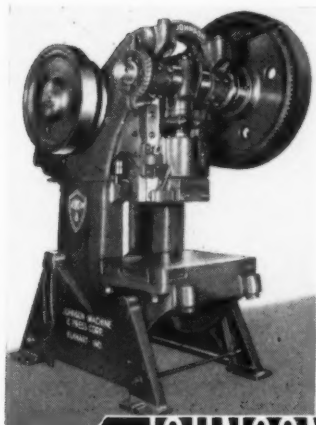
contact blades to pass over half of the radius of the bearing surface. The spindle of the micrometer is then adjusted to bring the tips into contact position. The instrument is removed,



and the reading taken directly from this setting. Direct reading eliminates 50% of the possible error in the present two-step method of caliper measuring. For additional information, write:

**Tubular Micrometer Co., Dept. BB  
St. James, Minn.**

NOT TOO BIG FOR SMALL RUNS — NOT TOO SMALL FOR BIG RUNS



**90 TONS**  
and MORE DIE SPACE!

*Johnson*

**No. 8**

**INCLINABLE  
POWER PRESS**

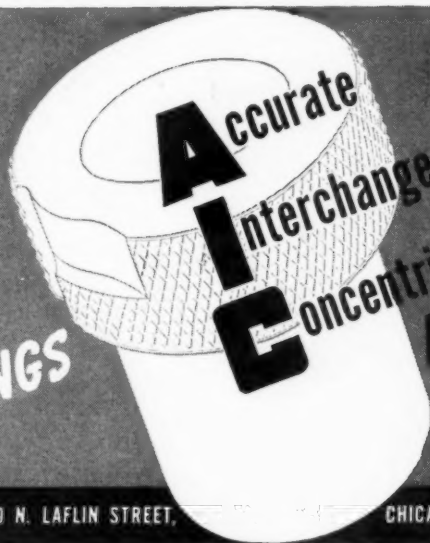
Extra thick bolster plate interchangeable with thin steel bolster . . . massive semi-steel cast frame . . . extra long gibs . . . friction type brake . . . patented tripping device.

**JOHNSON**

**MACHINE AND PRESS CORP.**  
620 W. INDIANA AVE., ELKHART, IND.

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CATALOG

**DRILL  
JIG  
BUSHINGS**



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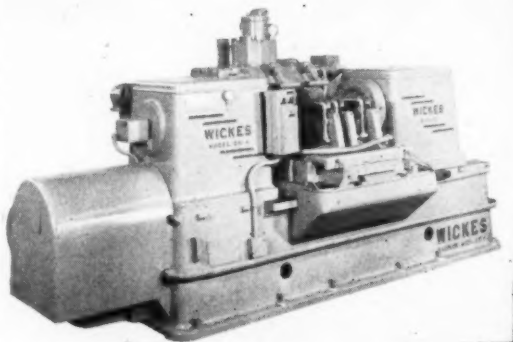
CHICAGO 7, ILLINOIS

When Writing Advertisers Please Mention **MACHINE** and **TOOL BLUE BOOK**

241

## **AUTOMATIC CRANKSHAFT MACHINE PRODUCES 35 UNITS PER HOUR**

The photograph at the right shows a new special machine just built by Wickes Brothers, manufacturers of heavy duty and special machinery. This unit is a double end drive crankshaft turning machine for high speed operation. It uses all carbide turning tools. The machine is arranged for the operation of rough turning and finish turning the outside diameter of the six counterweights as well as rough and finish turning clearance chamfers on the six crankarms all simultaneously on a 4-throw, five main line bearing V-8 type forged crankshaft. The machine is completely automatic, and is capable of producing 35 crankshafts per hour.



The unit is provided with front and rear cam operated angular cross slides as well as longitudinal turning slides mounted in the back tool housing. Hydraulic feed is provided to all tool slides. The machine is powered by a



## **SAVE HANDS WITH STRANDS**

**SAFEGUARDS  
FOR PUNCH  
PRESSES**

*Send for Enclosure  
and  
Sweep Safeguard  
Circulars.*

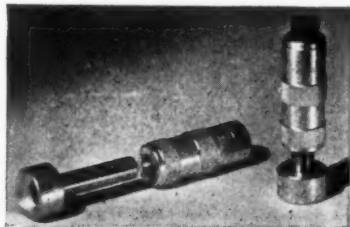
**STRAND MFG. CO., INC.**  
**SAFETY ENGINEERS**  
607 W. Lake Street, Chicago 6, Illinois

40 h. p. main drive motor, and has an approximate weight of 27,000 lbs. For additional details write:

**Wickes Brothers Dept. BB**  
Saginaw, Mich

**SUNNEN SPINNER ACCOMPLISHES  
PRECISION HONING**

The Sunnen Spinner, a recently developed tool for the honing of precision holes, consists simply of a 1/2" dia. hardened dowel pin, and a barrel made of SAE 1112 cold rolled steel. An air cushion is created in one end of the barrel by sealing the barrel with a stopper. A running clearance of about 160 millionths of an inch is maintained; this fit between the pin and barrel is practically air-tight yet the cylindrical bearing surfaces are so true that the barrel will spin freely for several minutes.



During a test run at a demonstration held at the recent A. S. T. E. Show in Cleveland, rough honing was done at the rate of 40 parts per hour, with a stock removal of from .003" to .004" from a reamed hole. Tolerance was held to .0001" on the diameter, and .000035" for straightness. The finish honing rate was 33 pieces per hour, with a stock removal from .0003" to .0004". The finish-honing tolerance was .00002" on the diameter, and specifications called for perfect roundness and straightness of the hole with a finish of 6 micro-inch R. M. S.

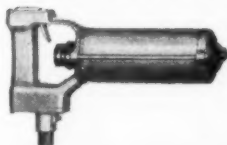
**Sunnen Products Co., Dept. BB**  
7935 Manchester Ave.  
St. Louis 17, Mo.

*How Much Concrete  
Drilling and Cutting  
is Done in Your Plant?*

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DEPENDABLE

**ELECTRIC  
HAMMERS**



**SAVE MONEY AND TIME**

Drilling Bolt Holes to Anchor  
Machinery and Shafting.

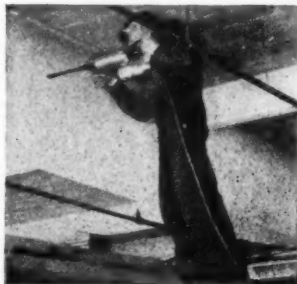
Cutting Holes for Steam Pipes,  
Water Pipes and Air Lines.

Channeling for Conduit  
—and a host of other time  
and labor-consuming jobs.

*Illustrated folder on request*

**SYNTRON CO.**

300 Lexington  
Homer City, Pa.



## ARTUS ARBOR SPACERS



The **COLOR** tells  
the **THICKNESS**

ARTUS Arbor Spacers made of plastic in various colors identify thickness at a glance! .001, .0015, .002, .003, .005, .0075, .010, .030. Speed up accurate fitting at low cost. Write for folder.

### CONVENIENT TRIAL OFFER Handy Spacer Assortment

10 ea. .001 — .0125 thick  
5 ea. .015 — .030 thick

#### 100 SPACERS IN ALL

7/8" — \$3.10 1 1/4" — \$3.80  
1" — 3.35 1 1/2" — 4.70

Other standard sizes also available.

*Illustrated Folder Free.  
Immediate Delivery on  
Spacers, Gaskets, Shims*

### INDUSTRIAL PRODUCTS SUPPLIERS

434 Broadway New York 13, N. Y.

## TORIT DUST COLLECTOR NO. 68

The Torit No. 68 Dust Collector has sufficient filter cloth area to provide a 4 to 1 filter velocity (4 c. f. m. through each sq. ft. of filter cloth). There are twenty filters, each measuring 18" x 16" — 80 sq. ft. The unit develops 320 c. f. m. air velocity, 6700 f. p. m., static pressure 4", through one 3" inlet. There is a 7/8" space between each filter, assuring utilization of the entire area of both sides of each filter.

A slotted, cast frame is provided, and each filter slips through the frame into an individual slot, assuring a dust-



proof seal. The felt insulation is fastened to the filter frame; as illustrated, 3 hold-down bars are fastened to the frame to hold the filters in place.

The cabinet measures 29 1/2" wide, 40" high, and 26" front to back. The dust pan is 3" deep, 25" front to back, and 26 1/4" wide, providing 1970 cu. in. of dust storage capacity. The unit is equipped with a 1/2 h. p., 3450 r. p. m. motor, and a 7-11/16" x 1 1/2" fan.

The new Torit No. 68 Dust Collector is recommended for installation where local code conditions require equipment providing low filter velocity, and for any installation where high filtering efficiency is desired. The low air volume-filter area ratio insures maintenance of the original operating character-

MODEL  
**VH-2**  
**FLEXIBLE  
BELT**

*"The All Purpose Machine"*

- CONTACT
- FLEXIBLE
- PLATEN
- CONTOUR

**FLOOR OR  
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*Hammond Machinery Builders*  
1614 Douglas Ave. • Kalamazoo 54, Mich.

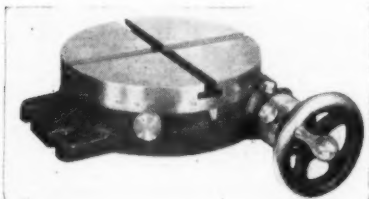


istics over a longer period of time than is possible where filter cloth is called upon to handle a large air volume. For complete details, write:

**Torit Mfg. Co., Dept. BB**  
Walnut & Exchange Sts.  
Saint Paul 2, Minn.

#### NEW ROTARY LAYOUT TABLE

The new Ideal Rotary Layout Table has been developed to facilitate accurate layout work. The table is calibrated in 360° of rotation; an index on the adjusting spindle permits settings to within six minutes. The worm and gear are accurately cut, the worm being hardened and polished. Provision is made for adjustment of mesh to compensate for wear or backlash.



The base, which is provided with four mounting slots, is cast from nickel alloy iron, and ground on both sides for parallelism. Two machined right angle T-slots are provided to secure work to the table. For complete information, write:

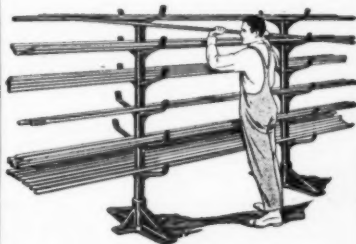
**The Erwood Co., Dept. BB**  
214 Woodstock St.  
Crystal Lake, Ill.

#### PORTER HAND POWER CUTTERS

In announcing their new redesigned complete line of Hand Power Cutters featuring 15 improvements, H. K. Porter, Inc. stress a new degree of ease, strength, safety and performance in the cutting of bolts, wire, cable, chain, bars etc. Among the 15 improvements of particular benefit to users: curved toe-in handles which decrease armspread and wrist bend making an easier and stronger pull, broad palmfit grip which reduces fatigue, no protruding screws



Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard interlocking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or further apart, while increases of stock can be met by simply adding more standard units. Built from metal throughout, depreciation is practically all. SEND FOR BULLETIN NO. 26-B.

### BROWN SECTIONAL RACK

**BROWN ENGINEERING CO.**

126 N. THIRD ST. READING, PA.

RACKS • VISES • SLUTCHES • COUPLINGS



## Universal Stock Reel

The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
2. Reel is adjustable to suit height of Press.
3. Reel can be inclined to any position.

PRICE \$55.00 F. O. B. BROOKLYN, N. Y.  
Manufactured By  
**John Humm Safety Equipment Co.**  
253 SHEFFIELD AVENUE  
BROOKLYN 7, N. Y.



## SAFETY WORK-STOP for drill presses

Easily installed  
and operated  
Pull to work  
it's locked—  
Any angle

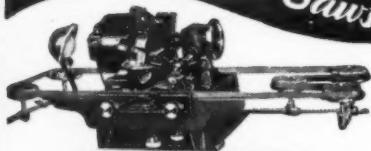


Stop No. Width (Table) Depth F. O. B. s.p. Weight

1 B	12-16	10-16	13.95	6 lbs.
2 B	16-24	16-24	15.95	8 lbs.
3 B	24-30	24-30	17.95	10 lbs.

**KAY MANUFACTURING CO.**  
Columbus, Indiana

## Recondition Old Saws



With the **HOWE LINDSEY  
AUTOMATIC  
SAW SHARPENER**

- HACK SAWS
- BAND SAWS
- CIRCULAR SAWS
- MEAT SAWS

**HOWE AND SON Inc.**  
HINSDALE N. H.



## "Production" Type S CENTERLESS SURFACER POLISHER BUFFER

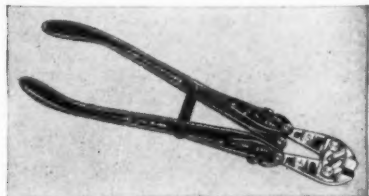
Cut production costs with this versatile machine which combines a centerless feed-polishing machine with a vertical or horizontal belt surfacer, polisher or buffer. Ideal for cylindrical polishing or straight line finishing on flat work.

Outstanding features—Quick Change from vertical to horizontal—Adjustable Gauge for bevels—Tracking Device for quickly tracking belt and Automatic Take-Up for stretch of belt.

Write today for information.

**PRODUCTION MACHINE CO.**  
GREENFIELD, MASS.

or bolts to catch, metal safety handle stop, 30% greater tool strength in sections and handles, jaws plainly marked showing capacity and type of metal safety to cut.

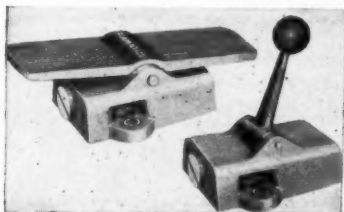


A folder is offered describing the complete line, recommending the cutter that should be used for each kind of cutting job. Write:

**H K. Porter Co., Dept. BB**  
Somerville, Mass.

#### HAND AND FOOT CONTROLLED VALVES

The Airmatic Valve, Inc., manufacturers of air controlled valves, has developed two non-corrosive Hand and Foot Controlled Valves. Both units, Model HF-3 (3-Way), and Model HF-4 (4-Way) have the same precision-machined internal parts and are designed for locking or non-locking with neutral.

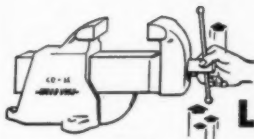
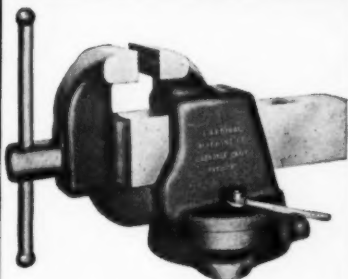


These valves are of rugged, compact design especially adaptable for the positive, accurate control of small single-acting and double-acting cylinders on continuous-operated machines. Either type is available in 1/4" size. For details, write:

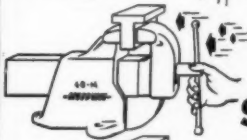
**Airmatic Valve, Inc., Dept. BB**  
1643 E. 40th St.  
Cleveland, Ohio.

## CARDINAL

**SPEED VISE**



**LIFT**



**SLIDE**



**LOCK**

**RUGGED  
ACCURATE**

*and* **FAST!**

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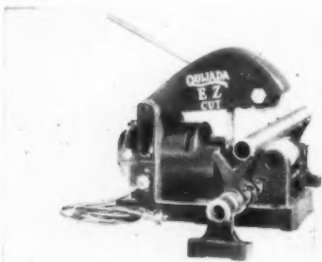
**CARDINAL MACHINE COMPANY**

The **SPEED VISE** Manufacturer

DULDALE, CALIFORNIA

### **AUTOMATIC FEATURES DISTINGUISH PIPE CUTTER**

Power-driven rollers, automatic stop-start action, and ball-bearing operation throughout are features of this new high speed "E-Z Cut" pipe and tube



cutter. This compact portable unit facilitates pipe and tube cutting operations, in diameters ranging from 3/8" to 4". Cutting cast iron pipe within the same range is also possible.

An integrally-mounted, 1/2 h. p., 110 volt, universal type ac-dc motor

furnishes direct gear drive to the rollers, rather than to the cutter wheel. The gears are self-lubricating. An automatic trip-switch initiates the cutting phase when the cutter wheel contacts the pipe, and stops automatically when the cut is finished. Adjustable roller yokes provide the necessary support for the pipe, yet permit free rotation. For complete details, write:

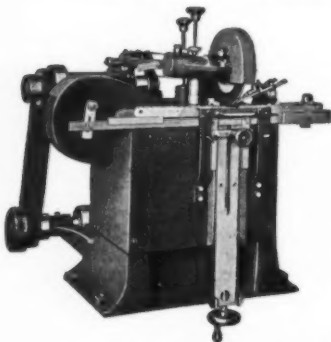
**Quijada Tool Co., Inc., Dept. BB**  
5474 Alhambra Ave.  
Los Angeles 32, Calif.

### **LIGHTWEIGHT WELDING HELMET**

A lightweight helmet, weighing only 19 ounces has been announced by the Willson Products Co. Glass for the helmet is available in 12 different shades to meet job requirements. Clear cover glass protects welding glass from pitting. Lenses easily removed and cleaned. Helmet is made in one piece of dense vulcanized fibre. It extends below and under the chin as well as over the ears for protection from flying sparks

---

## **E. C. Saw Sharpener Can Reduce Blade Inventory by 80%**



E. C. automatic metal saw sharpener is capable of sharpening hack, band and circular saws with unmatched precision.

Will not burn, anneal or in any way injure hardness of tooth. Blades cutting stainless steel 4" sq. billets have been used 250 hours when resharpened at 8 hour intervals.

Write for bulletin E.C.

---

**THE WARDWELL MANUFACTURING CO.**  
3165 Fulton Road, Cleveland 9, Ohio

---

and hot metal. Strong spring action at the hinge keeps helmet in raised position when not in use.



**Willson Products, Inc.**  
Dept. BB, Reading, Pa.

#### **SAPPHIRE AND RUBY INDICATOR POINTS**

Corundum Company, Inc., announces a sapphire or ruby-tipped dial indicator gage contact point, made with hexagonal buffed stainless steel bodies .187" across the flats and .437" long overall, with 4-48 thread, .187" long. The jewels are 1/8" diameter with .187" point radius cemented and spun into the bodies and brought to a high polish.



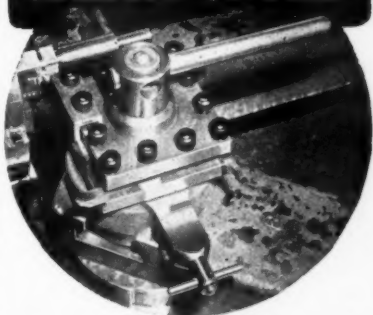
The points will fit most bench type indicators, and may be installed by hand or with a small wrench. Special threads are available. For information, write:

**Corundum Co., Inc., Dept. BB**  
1777 E. 87th St.  
Cleveland 6, Ohio.

## **YOUR Lathe Can PRODUCE MORE WORK**

with a

*Colwell Turret*



*Because There's*

### **NO TIME LOST changing tools.**

With a Colwell Turret, you set up **ONCE**, to do **FOUR** successive operations. Get the whole story of this proven production tool. Ruggedly built, positive indexing for close tolerance work, and economically priced. Sizes for most lathes.

**As Low as \$36**

*Send now for catalog.*

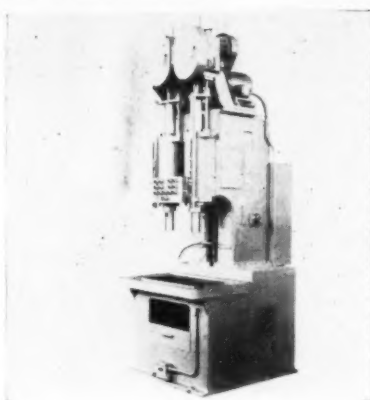
**S. G. COLWELL**  
25 Congress Ave.  
Providence, R. I.

## MOLINE SINGLE OR MULTIPLE COLUMN DRILLER

A recent development by Moline Tool Co. is the HF148 drilling machine. The photograph shows the machine made up as a two-column model with individually controlled hydraulic feed to each of the two spindles; it can also be built as a single-column, single-spindle unit, or as a multiple-column, multiple-spindle machine.

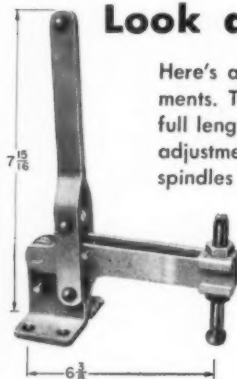
The spindle is designed with capacity to drive a  $1\frac{1}{8}$ " drill in mild steel. The machine can handle a variety of drilling and reaming jobs, and can be used as a production machine when fitted with appropriate fixtures.

Electrical control of the hydraulic feed permits an independent, automatic operating cycle for each spindle which can be initiated by push-button or foot-operated switch. Selector switches in the push-button station can be set so that either spindle will repeat the feed cycle continuously until stopped by the operator. In the two-column model, both



spindles can be run in alternate, continuously repeating cycles by means of electrical interlocking. While one spindle is drilling, the other is in the

## Look at this *Versatile Clamp*



### This is Model V-400

The same type clamp is available with solid bar (without channel), Model VC-400. Recommended pressure of both is 400 lbs.

Here's a clamp that has both vertical and horizontal adjustments. The threaded spindle can be moved anywhere along full length of channel bar to give you a wide range of varied adjustments with the one mounting. Moreover, additional spindles can be placed on bar to accommodate varying thicknesses of parts held.

Remember, Knu-Vise clamps hold work with bull dog grip which can be released instantly.

Send for new complete catalog

**KNU-VISE  
PRODUCTS**

**LAPEER MANUFACTURING CO.**  
3056 DAVISON ROAD • LAPEER, MICHIGAN

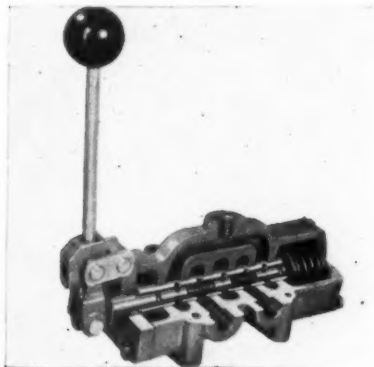
"up" position so that the operator can be reloading the fixture. For additional data, write:

Moline Tool Co., Dept. BB  
100 20th St.  
Moline, Ill.

#### ADEL HYDRAULIC 4-WAY SELECTOR VALVE

A new series of hydraulic 4-way selector valves, designed for 1000 p. s. i. pressures for control of one double acting cylinder, or two single acting cylinders, is announced. The spool-type construction permits a wide variety of porting arrangements for either open-center or closed-center hydraulic systems.

The spool is completely hydraulic and balanced axially as well as radially.



The large diameter spool assures maximum oil flow with a minimum pressure drop. The spool is precision-machined, hardened steel and the sleeve is heat-treated steel. A dirt-excluding shaft seal keeps foreign materials from working into the valve mechanisms. Many different models are available. The are manufactured in 1/4", 3/8", 3/4", and 1" pipe thread port sizes with flows to 32 g. p. m. For complete information and specifications, write:

Adel Precision Products Corp.  
Dept. BB  
Burbank, Calif.

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USED

ALL OVER THE WORLD

... IN MANY DIFFERENT  
APPLICATIONS

"OUTWEARS THE BEST  
BRONZE METAL"

20 years

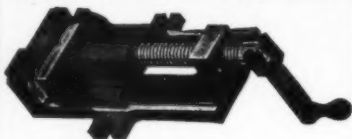


ARGUTO OILLESS BEARING CO.

WAYNE JUNCTION

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## YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, inches	Opens inches	Weight Pounds
1D	3½	3½	12½
2D	5	5½	23

Do you need a vise of ANY type?

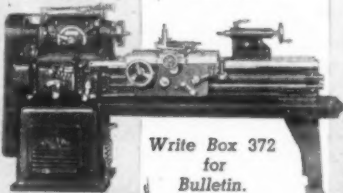
*Write today for bulletins on the extensive Yost line*

**YOST MFG. COMPANY**  
1335 SO. MAIN ST.  
MEADVILLE, PENNSYLVANIA

## CARROLL AND JAMIESON LATHES 15" AND 16"

12 Speed Geared  
Head Motor Drive  
Timken Mounted  
Spindle

Modern Design—  
Liberal  
Dimensions



Write Box 372  
for  
Bulletin.

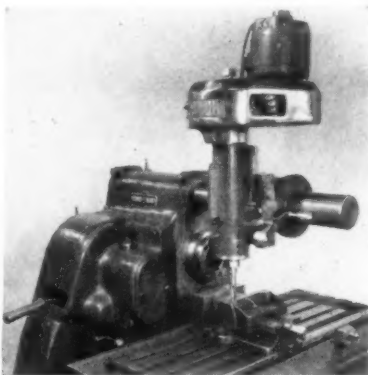
**THE CARROLL & JAMIESON  
MACHINE TOOL CO.**

SAVANA OHIO, U. S. A.

## SPEEDMILLER 6-SPEED MILLING AND BORING HEAD

Two recently developed universal milling, boring and profiling heads are announced by the Veet Manufacturing Co. These units, designated as Speedmiller Jr., and the Senior Speedmiller, have similar characteristics, their only distinguishing factors being the difference in their capacities.

The Speedmiller Jr. is designed for attachment to mill overarms from 2¼" to 3½" in dia. It accepts collet sizes of ¼, 5/16, 3/8, 7/16, and ½-inch. The feed for the unit is provided from the mill table. The Junior model is equipped with a heavy duty spindle, No. 7 B & S taper.



The Senior Speedmiller is for mill overarms 3½" to 5" in dia. Collet sizes of ¼, 3/8, ½, 5/8, and ¾-inch. A heavy duty spindle, No. 3 Morse taper, is provided. The model is equipped with a precision vee-slide, with 4-inch travel.

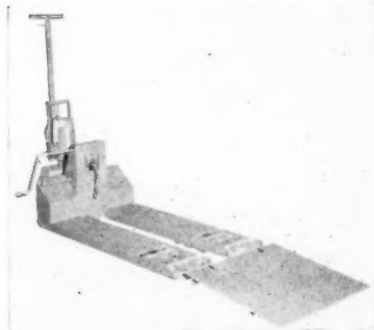
Both models are equipped with a full 360° swivel in both planes. They are adjustable to all angles, vertical to horizontal. Six speeds, from 350 to 3000 r. p. m., with quick change unit, are provided. Power is supplied by a single phase, 110/220 volt electric motor; a triple phase motor with reversing unit is available upon order. Speedmillers are unconditionally guaranteed



for one year against defective workmanship. For complete details, write: **Veet Manufacturing Co., Dept. BB** 25757 Groesbeck at 10½-Mile Road East Detroit, Michigan

#### HYDRAULIC PALLET TRUCK WITH WINCH AND RAMP

Materials handling equipment for moving and lifting heavy cases weighing up to 6000 lbs. has been developed by the Lyon-Raymond Corp. engineers.



A combination ramp and winch arrangement has been adapted to a standard pallet type hydraulic lift truck with a lowered height of only 3¼". By means of the winch and cable, a case can be drawn up the ramp and on the truck platform for easy transportation.

In placing cases in storage, the load is wheeled into position, and the truck is elevated 4". Blocks are placed under the overhanging sides of the case, the truck is lowered and removed, and the case rests on the supports. In this position, it can be easily moved by bringing the truck into position, and elevating it to raise the load from the supports. The ramp is hinged and easily removed. The winch is furnished with 15 feet of steel cable. For additional information, write to:

**Lyon-Raymond Corp., Dept. BB**  
4702 Madison St.  
Greene, N. Y.

#### Monarch Precision SHAPLANE Radius Tools



Patent Pending

For Lathes, Shapers, Planers, Boring Mills, etc. Min. Rad. ½" to Max. Rad. 2½". Made in 3 Models.

**C. B. TEETER**  
Machine Specialities  
4470 Oakenwald Ave., Chicago 15, Ill.  
Phone Drexel 3571



#### with MAJESTIC DRILL SHARPENER

Now you can always have perfectly sharpened fast-cutting drills that really take the proper bite and cut smoothly without chatter. Simply turn the Automatic Dial Control, and Majestic Drill Sharpener is set to grind both cutting edges and both angles exactly alike. Take any size drill from 5/32" to 1", straight or No. 2 taper shank. Fits any grinder. Adjustable to grind drills for cutting hard or soft materials. The Majestic Drill Sharpener is a real production tool that assures longer drill life, speeds up the work and quickly saves its cost in factories, garages and repair shops. Price \$10.95 F.O.B. Factory, ask your supply house, or order direct. Many thousands in use. Circular on request.

Dealers, Jobbers: Write for information

#### MAJESTIC DRILL SHARPENER CO.

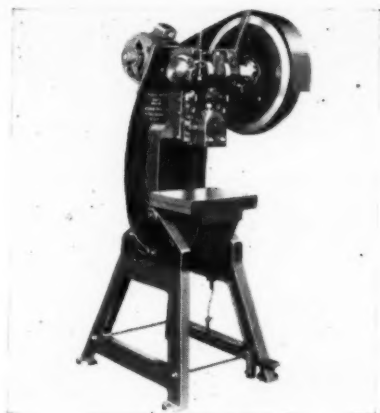
1335 So. 6th Street Minneapolis 4, Minn.

## IMPROVED PRESS-RITE PRESSES FEATURE SINGLE STROKE CLUTCH

Improvements in the entire line of Press-Rite Presses, plus the addition of a new 12-ton press, illustrated, are announced by the Sales Service Machine Tool Co. All units with the exception of the No. 0 Press are now built with anti-friction roller bearings in the flywheels. Weights have been equalized in the flywheels throughout the entire line.

Another improvement is the positive single stroke clutch. The clutch dog engages into a 4-point steel ring attached to the flywheel hub; this engaging and disengaging mechanism is especially designed for a positive single stroke purpose.

The engaging and disengaging pawl is operated by a cam, built in the crank drive integral collar. This cam revolves with the crank, and when the clutch is engaged, the pawl is locked in a positive position until the clutch dog is completely disengaged out of the clutch drive ring. The clutch treadle must be



completely released to an upward position before the clutch can be tripped for the second stroke.

## THIS CATALOG GIVES-

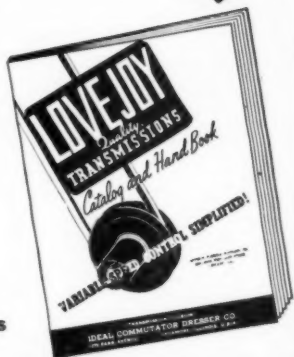
Complete Information to help you select the type of variable speed transmissions for your requirements.

### LOVEJOY

Variable Speed Transmissions enable instant selection of speeds. Available from fractional to 8 h.p. in ratios up to 10 to 1.

*Write today.*

**LOVEJOY FLEXIBLE COUPLING CO.**  
**5026 W. Lake St., Chicago 44, Illinois**  
*Mfr. of Lovejoy Flexible Couplings*



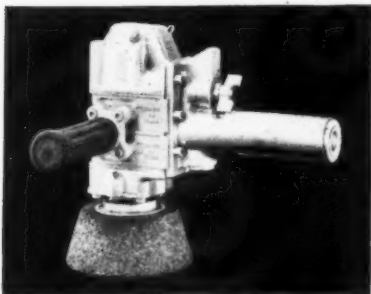
All Press-Rite Presses are now equipped with a special cam-actuated automatic brake, eliminating all brake adjustments except the occasional take-up for usual wear.

Sales Service Machine Tool Co.  
2363 University Ave., Dept. BB  
St. Paul 4, Minn.

#### NEW VERTICAL GRINDER HAS WIDE VERSATILITY

A new Vertical Grinder has been developed for use on both large and small castings, leaving a flatter, smoother finish than attained by straight type of grinder. It can be used for leveling off welds, removal of gates, fins, etc. The unit attains a speed of 8000 r. p. m. for 4" elastic wheels, and speeds of 5000 and 6000 r. p. m. for 5" wheels.

The accessory can also be utilized for sanding with 5" pads at 8000 r. p. m., and for 7" pads at 6000 r. p. m., for finishing sheet metal and smoothing up electric welds. The power is ample for the heaviest types of metal removal. It employs an external blade type Rotor Motor of Twin Cylinders. The unit is only 8" high, enabling it to be used



in close quarters. It is equipped with a governor which idles the machine and permits the free speed as determined by the Safety Code, but opens quickly and positively to deliver full air at high load speed, which in turn gives high metal removal, and easy operation.

The Rotor Tool Co., Dept. BB  
Cleveland 12, Ohio.

## Quick Acting JOHNSON FURNACES

- Treat High Speeds Steels
- Harden High Carbon Steels
- Braze Carbide Tipped Tools



**JOHNSON  
Hi-Speed  
No. 120**

A FAST, versatile unit for toolroom and shop. Hardens any steels. Gets the job done quickly to save time and gas. Compact, powerful, and remarkably economical to operate. Easily regulated. Firebox 5 x 7 1/2 x 13 1/2. Complete with Carbofrax Hearth, G.E. Motor and Johnson Blower.

**\$145.50** F.O.B. Factory

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**for Cutting down**  
**CUTTING COSTS**



*see your  
Star  
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**FREE BOOKLET OF HACK SAW HINTS.** Specification, tips on use, prices. Free from Star suppliers.

Moreover, Star blades will prove themselves right on whatever you're cutting — metals, plastics or other non-metallics . . . right in the way you want it cut—clean, fast, calling for few blade replacements. So far cutting down cutting costs, your best bet is Star's complete line and your Star supplier.

**HAND BLADES**

**FRAMES**

**POWER BLADES**

**BAND SAWS**  
(Metal cutting, including Skip-tooth)

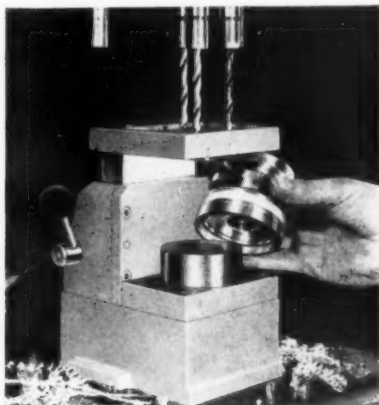
Sold only through  
recognized distributors

**CLEMSON**  
CLEMSON BROS., Inc., Middletown, N. Y.  
Makers of hand and power hack saw blades,  
frames, metal cutting band saw blades and  
the Clemson Z-17 down machine

## PNEUMATIC DOUBLE-ACTION JIG-VISE

The Deublin Pneumatic (Double Action) Jig-Vise supplies a clamp for production work to be drilled, filed, ground, polished, or assembled. It is constructed of cast iron, cast aluminum, and stainless steel; all operating parts are enclosed. A grease pocket system maintains constant lubrication which virtually eliminates maintenance.

The open front design of the Jig-Vise facilitates the setting and removal of work from three sides of the unit, and permits work of a wide variety of shapes and sizes to be handled.



A double acting cylinder, with a 1" stroke, requires only one air line for positive power in either direction. The "on and off" air control valve, which functions in a 45° arc, is adaptable to either left or right hand manual operation or automatic use. Speed of stop and return of the clamping plate is adjusted by set screws at the back. With the addition of a valve in the air line, clamping pressure can be adjusted up to 10 times line pressure. For further details, write:

**The Deublin Co., Dept. BB  
Northbrook, Ill.**

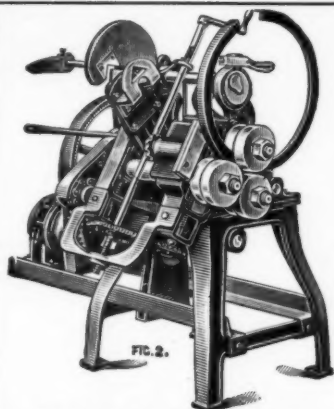


FIG. 2.

No. 14 Angle Rolling Machine  
ROLLS ANGLES, TEE IRON, PIPE,  
FLATS, ROUNDS AND SQUARES  
CAPACITY — 2" x 2" x 1/4" ANGLE

EXCELSIOR TOOL & MACHINE CO.

## HERE IS A *Machine* THAT HAS FOUND ITS WAY INTO *40 States*

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FARM MACHINES AND METAL  
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### POWER AND FOOT OPERATED

For riveting, staking,  
stamping and similar  
operations on small  
light parts. Constructed  
to compensate for va-  
riation in thickness of  
the work and to deliver  
a UNIFORM BLOW AT  
EVERY STROKE.



M-110 (illustrated) motor  
driven to eliminate fatigue  
factor of foot operated  
press—similar press M-130,  
equipped to operate by  
compressed air.

### OTHER T & F MACHINES

Duplex Spline  
Millers — Me-  
dium Duty and  
High Speed  
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ing Machines.

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EST. 1834

**THE TAYLOR & FENN CO.** HARTFORD 1, CONN.

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**TWECOTONG** Electrode Holders are made in 200, 250, 300 and 500 ampere sizes. Fully insulated, simple, efficient. All parts replaceable. Insulation almost indestructible.



**Redhead Ground Clamps** come in 125, 300 and 500 amp. sizes. Rugged, efficient, low cost.

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Manufactured by

**TWECO PRODUCTS COMPANY**  
1048 E. English Wichita 1, Kans.

In Canada: G. D. Peters & Co.  
of Canada, Ltd., Montreal

Export: Henry Jahn & Son, 7 Water St., N. Y. C.

**TWECO  
PRODUCTS**



## Use the RIGHT TOOL for the Job



The **RIGHT TOOL** to remove a broken tap is a **WALTON TAP EXTRACTOR**. This specialized tool has paid for itself time and time again, throughout the metal working industry, in both time saved and pieces salvaged. It will pay you to keep your crib stocked with a full set of Walton Extractors.

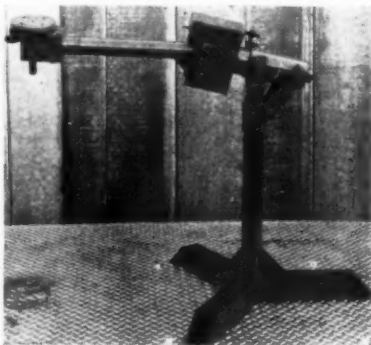
Learn about Waltons at our expense. Write for folder No. 12 and full details about our **30 DAY FREE TRIAL OFFER**.

**THE WALTON COMPANY**

Hartford 10, Connecticut

## ADJUSTABLE POSITIONER FOR ANGULARITY CHANGES

The Model 14-C500 Quick Adjusting Aronson Universal Balanced Positioner, designed by the Aronson Machine Co., is a device which is adapted for short-run work, and for jobs that require changes in angularity during the working cycle of each piece in production runs. To explain the need for changing the angularity during the work cycle, an example is cited of an assembly having a base structure to which partitions are added to, one at a time. The addition of each partition changes the location of balance in the work, which

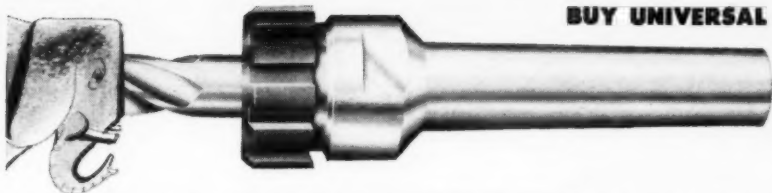


has to be compensated for in the angularity of the positioner arm. In the illustrated model, this is done by turning the worm in one quick adjustment.

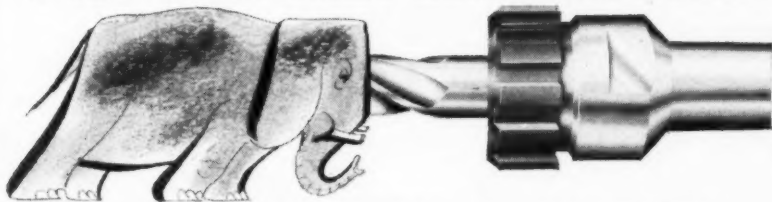
In the shop where only a few pieces are made in one production run, this positioner enables the operator to turn out work at a faster rate of production. The Model 14-C500 will take work up to a 500 pound capacity safely, regardless of the diameter, as long as the center of gravity is on the center of the work table, and within 11½" of the top of the work table. The work plate height covers a range of from 24" to 48". For complete operational details, write:

**Aronson Machine Co., Dept. BB  
Arcade, N. Y.**

**BUY UNIVERSAL**



**6 TON THRUST LOADS CAN'T BUDGE TOOLS**

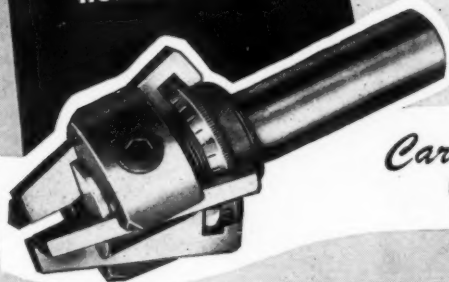


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**UNIVERSAL ENGINEERING COMPANY**

FRANKENMUTH 10, MICHIGAN

**Kutmoré**  
HIGH SPEED  
ADJUSTABLE  
HOLLOW MILLS



Designed for modern production requirements. Saves time, effort and motion. Has a two way micrometer adjustment with locking device to assure absolute cutting accuracy.

Kutmoré Hollow-Mills may be had with straight or taper shanks, high speed or Carbide Tipped blades. Insist on Kutmoré for accuracy, speed and economy. Prompt delivery. Write for Catalog No. 15.

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ROCHESTER 5, N. Y.



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Curtiss-Wright Corporation ranks our product with their best tools. Cleveland Graphite Bronze Company, leading bearing manufacturer, states new high accuracy reached, plus substantial production boosts.

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**YOUNG ARBOR CO. • PH. YE-9784**  
3257 Bradford Rd., Cleveland Hts. 18, Ohio

**LITTELL**

**REELS**

**for faster Production**

LITTELL Automatic Centering Reels are constructed with four arms which operate all at the same time. A free loop of material is supplied to automatic feed, regardless of weight of coil.

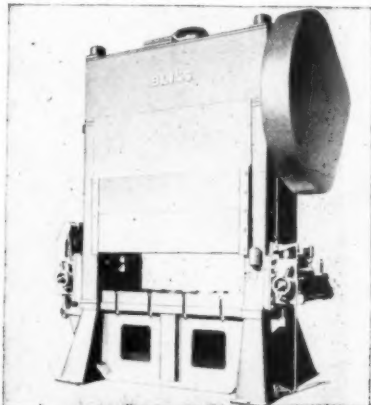
Littell Reels are made in 100-lb. to 20,000-lb. capacities. Automatic spindle and cradle types. Plain and motor-driven. Used in thousands of plants for faster production.

Other Littell products include Roll Feeds, Dial Feeds, Magazine Feeds, Air Valves, Straighteners, Scrap Winders, Free-Vac Safety Feeders, **REQUEST BULLETINS.** Mechanical Pickers, etc.

**F. J. LITTELL MACHINE CO.**  
4153 Ravenswood Ave., Chicago 13, Ill.

### BLISS 300-TON PRESS DEVELOPS 35 STROKES PER MINUTE

E. W. Bliss Co. has introduced the largest press in its No 600 Series of High Production Presses, in 17 sizes, ranging from an 8-ton press to the new 300-ton unit. The new press, No. 6290-D, is completely automatic, with double roll feed and scrap shear synchronized so as to feed and trim predetermined lengths.



Specifications and dimensions of the new unit include a frame construction of stress relieved, steel weldments, with bed, uprights, and crown held together by four pre-shrunk steel tie rods. The bed is arranged to receive die cushions; the die space from the bed is 23½"; from the top of the bolster, 17"; bed area is 42" deep (front to back) by 84" wide (right to left). The press has single gearing, with single end drive, the herring-bone gears are run in oil.

Distance between the uprights to clear is 84". The slide area is 32" deep x 77" wide. The stroke of the slide is 6", with from 30 to 45 strokes actuated per minute. An air friction clutch is furnished with electric push button controls.

**E. W. Bliss Co., Dept. BB**  
450 Amsterdam Ave.  
Detroit 2, Mich.



**MILLING**

**BURKE**

**MACHINES**



Above: No. 4 Motor Driven Milling Machine. Nos. 1, 2, 3, and 4 are specially suited for handling small, difficult work on a production basis.

**FOR SMALL, DIFFICULT WORK ON A PRODUCTION BASIS . . .**

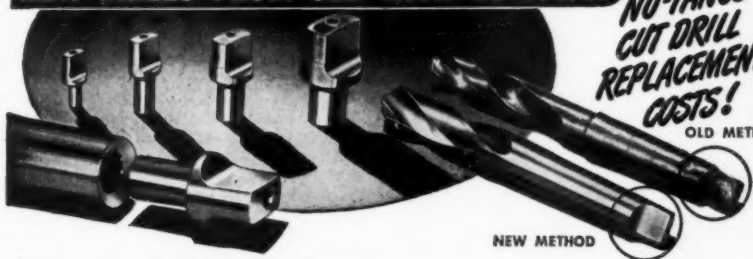
**GENERAL SPECIFICATIONS**

Mach. No.	Working Surface of Table	Longitudinal Feed	Traverse Feed	Vertical Feed	Maximum Distance between center of spindle and table
1	3½x12	8	3%	4½	5¼
2	3½x16	6	2	4½	5
3	3½x12	8	3%	7½	7½
4	3½x16	8	3	8	8

Write **TODAY** for complete information, specifications, attachments not shown in above table.

**BURKE MACHINE TOOL CO.**  
510 Sandusky St. Conneaut, Ohio

**NEW DRILLS FROM OLD WITH NU-TANGS**



**NU-TANGS  
CUT DRILL  
REPLACEMENT  
COSTS!**

OLD METHOD

NEW METHOD

Send us your old drills—we'll make them new again at a fraction of the cost of a new drill! Exclusive **NU-TANG\*** process replaces twisted or broken tangs with brand new tangs of correct size—and with **GUARANTEED ORIGINAL STRENGTH**. No welding—No distortion—No shortening of drills—No sleeves.

Any drill, reamer, or other tool with a Morse taper in sizes 2 to 6 can be repaired perfectly this quick new way. Delivery—One week. Used by many leading industrial plants. Amazingly low cost—satisfaction guaranteed! Send for complete information.

\*Patent Pending.

**NU-TANGS INC.** 1337 Bates Street  
Cincinnati 25, Ohio

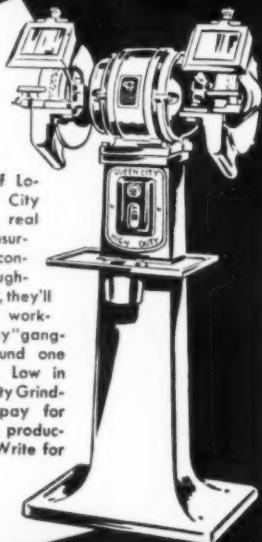
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A battery of Lo-Cost Queen City Grinders is real production insurance. Placed conveniently throughout your plant, they'll stop wasted work-hours caused by "ganging up" around one lone grinder. Low in cost, Queen City Grinders quickly pay for themselves in production gained. Write for Catalog.

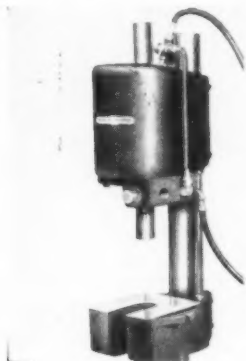


**QUEEN CITY  
MACHINE TOOL CO.**

**235 E. Second St.  
CINCINNATI 2, OHIO**

#### **BENCH TYPE AIR IMPACT HAMMER**

"Exploded Air"—a new development in air mechanics—makes possible the production of one ounce to 12,000 pound impact with 100-pound line pressure in this new bench-type production hammer. Air under high compression is equalized on both sides of the piston. Suitable for many types of light stamping and forging, and other processes, this unit will do production work on up to  $\frac{1}{4}$ " mild steel rivets.



The operation is opposite to that of a mechanical press, in which the stroke is set to fit the job, and the impact varies only with the press capacity. In the new unit, the stroke is constant, but the impact pressure may be varied precisely up to the press capacity. The impact pressure then remains the same at any point along the stroke. Break-downs due to variation in stock thickness or to improper positioning are eliminated by this feature. The cushion of air behind the hammer takes up the shock, and the stroke then accommodates itself to offsize pieces without damage to work, dies, or press.

The bench height of the new hammer is 27"; stroke is 3"; distance between ram and base is 10", with a 26" column. The power unit may be adjusted up or down the post. The housing and base are semi-steel castings, precision machined. All moving parts subject to

wear are hard chrome plated Complete specifications are available from the manufacturer:

**Bryant Products Distributing Co.**  
297 W. Michigan Ave., Dept. BB  
Jackson, Mich.

#### NEW RUSNOK MILLING MOUNTING

Change-over of the Rusnok Milling head to an entirely new set-up can now be accomplished in a fraction of the time with the new "Rail-Type" mounting, designed and developed by Rusnok Tool Works. Milling attachments mounted with the "Rail Type" brackets are operated on either side of the overarm, or directly in front of overarm. The milling attachment can be quickly placed and rigidly locked in any position within a full 180° adjustment.

The new "Rail Type" Bracket is available and custom fitted to milling machines with a round over-arm within a range of 3" to 5" in diameter. It is adaptable to any old or new Rusnok milling attachment, and provides a multiple quick-change-over machine which is useful in every machine shop.



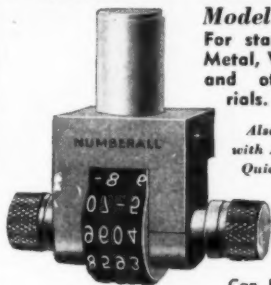
The new catalog on the "Rail Type" bracket and the Rusnok Milling attachment is now ready.

**Rusnok Tool Works, Dept. BB**  
4840 W. North Ave.  
Chicago 39, Ill.



## 2 WHEELS—Quick Change

**Model No. 85**  
For stamping into  
Metal, Wood, Fiber  
and other materials.

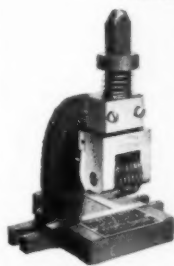


Also supplied  
with ALL Wheels  
Quick Change

Can be furnished with any number of wheels up to 20. With Two Wheels, the "Unit Wheel" and the "Tens Wheel" can be turned by using the two outside knobs to quickly set the required number. This greatly facilitates consecutive numbering.

BULLETIN BB-85

## NUMBERING MACHINE PLATFORM 45



For stamping fixtures, letters and fractions with uniformity and speed into brass, aluminum, zinc, unhardened steel, iron, etc. This method is faster than stamping with hand stamps, mono-wheel presses or type. Platform furnished with adjustable guide and thumb screw adjustment, enabling operator to locate the plates or tags with precision and speed. Stamp can be taken out of holder for stamping larger objects. Characters always properly aligned; of uniform depth.

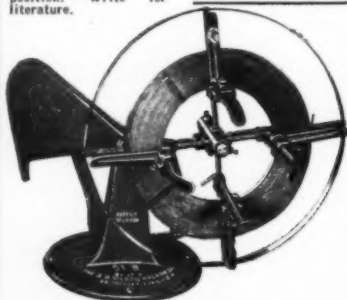
BULLETIN BB-45

**NUMBERALL STAMP & TOOL CO.**  
HUGUENOT PARK STATEN ISLAND 12, N. Y.

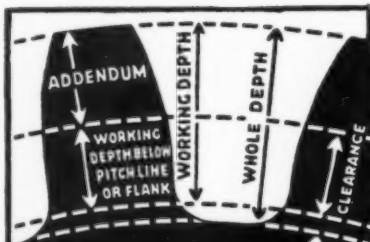
# NILSON

Reel is loaded by one man in less than one minute. . . . Automatic balancer eliminates hand lifting . . . avoids strains and accidents. Locking device automatically locks reel in position. Write for literature.

## WIRE AND RIBBON STOCK REELS



**THE A. H. NILSON MACHINE CO.**  
BRIDGEPORT, CONN., U. S. A.



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Send your specifications for quotation on any types of gears cut on modern machinery from any material.

**ABART GEAR & MACHINE CO.**  
MANUFACTURERS OF ABART SPEED REDUCERS

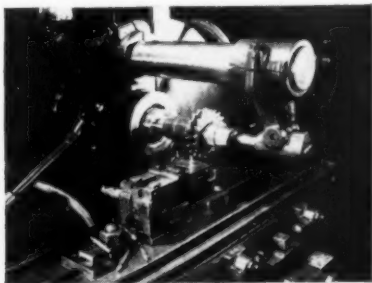
4832 W. 161<sup>st</sup> ST.

CHICAGO 50, ILL.

## INGENIOUS MILLING FIXTURE HAS SELF-CENTERING DEVICE

Accurate and rapid production is assured by the inclusion of a self-centering device in the Universal Part Holder, a new fixture introduced by Mueller Industries. The manufacturers announce that the Universal Part Holder can be used on milling, drilling, assembling, threading, counterboring, and similar operations. The device can be operated by manual, automatic, pneumatic, or mechanical means.

The self-centering unit of the Universal Part Holder assures precise locating of work, and is completely adjustable for variance in pressure, location, etc. The clamp jaws have a 3/16" maximum opening, which will allow a work piece to be gripped behind a shoulder. The device is simple and fast in operation. It will accommodate work up to 1", round or hex, or odd-shaped pieces within that range.



In many varied milling operations, this fixture is extremely useful. The Universal part holder is designed to allow for adequate chip clearance as well as sufficient coolant entry. Manual operation is accomplished by the use of the hand lever. By the addition of a connecting rod to the unit, it may be operated mechanically. For pneumatic operation, a plunger and air plug are inserted, and the unit is connected to an air hose. For complete details on the Universal Part Holder, write to: **Mueller Industries, Dept. BB**  
4755 N. Rockwell St.  
Chicago 25, Ill.

## STOCK ROOM CASE WITH DRAWER KITS

A handy case for holding all kinds of fastening devices is announced. It is constructed of plywood, and stands 15" high and 10" wide. It accommodates ten cardboard box drawer kits,  $9\frac{1}{2}" \times 4\frac{3}{4}" \times 1\frac{1}{8}"$ . Each box drawer kit includes six or more cardboard containers for holding the individual items.

The ten drawer kits include assortments of round head stove bolts, flat head bolts, 3 types of hexagon nuts, split lock washers, steel washers, 2 types of hexagon head cap screws and a wide assortment of cotter pins. Complete drawer kits or individual boxes are replaceable by the manufacturer.

The unit is equipped with a handle, permitting carrying from one bench to another and providing a means for maintaining all sizes, shapes and assortments separated, in perfect order, and quickly accessible.

In use, the drawer kit containing the item desired is slid from the case and the lid is bent back, exposing the small compartments holding the individual pieces. The inside of each drawer gives the sizes and pertinent data of each assortment. For further information:



**Production Screw & Nut Co., Inc.**  
3110 S. Michigan Ave., Dept. BB  
Chicago 16, Ill.



**TUBING CUTTER GROUP - FOR FAST DEBURRING OF EVERY MACHINEABLE TYPE TUBE ...**

<p><b>TUBE DEBURRING CUTTERS (Standard)</b></p>  <p>18 Standards in H.S.S. and Cemented Carbide</p>	<p><b>TUBE CHAMFERING MILLS</b></p>  <p>23 sizes from <math>3/16"</math> - <math>2-1/2"</math> O.D. — Chatterless</p>	<p><b>SOLID TUBE DEBURRING CUTTERS</b></p>  <p>16 sizes from <math>1/4"</math> - <math>1-5/8"</math> O.D. — H.S.S. and Carbide</p>	<p><b>SPECIAL TUBING CUTTERS</b></p> 
<p><b>ADJUSTABLE TYPE</b></p>  <p>Adjustable from <math>1/2"</math> - <math>2-1/2"</math> O.D. — for short runs</p>	<p>From light hand-deburring up to close tolerance deburring, chamfering, flaring . . . For working non-ferrous metal, steel (including stainless) and plastic tubing . . . For combining reaming, sizing or flaring with end facing and deburring . . . Whatever the operation or material, Severance HSS and Cemented Carbide Tube Deburring Cutters are TOPS in performance—long life—economy.</p>		

**COMPLETE REGRINDING SERVICE BY NEW TOOL CRAFTSMEN SAVES YOU MONEY!**

**SEVERANCE TOOL INDUSTRIES INC.**

722 IOWA STREET  
SAGINAW, • MICHIGAN

### U. S. EXPANSION REAMERS EQUIPPED WITH RING GAUGES

A new model of the U. S. Single Blade Expansion Reamer, which can ream exact-diameter holes to fit almost any size of soft metal bearings, including piston pins, has just been announced by the U. S. Reamer & Tool Corp. The



new reamer is provided with two additional features. Each size is supplied with standard and oversize ring gauges; after selecting the desired size of ring gauge, it is slipped over the reamer. The reamer is used in the customary manner, but when the bearing has been reamed to the proper size, the ring gauge prevents further expansion, and a perfect fit is obtainable.

U. S. Reamers are also equipped with a tungsten-carbide blade which lasts indefinitely, and produces an accurate ream-finish. The U. S. Reamer is claimed to be one of the fastest and most accurate reamers available because of its single expanding blade and independently expanding guide sleeves. In operation, the reamer sleeve is first expanded inside the bearing, providing a positive support. The blade is then advanced, and as metal is removed, the sleeve is expanded to hold

the bearing in absolute alignment. The Reamers are made in 32 standard sizes from 11/16" to 3 5/8". For further details, write:

**U. S. Reamer & Tool Corp., Dept. BB**  
124 S. Isabel St.  
Glendale 5, Calif.

### STOCK REELS RANGE FROM 150 TO 1000-LB CAPACITY

The LaBahn Machine and Mfg. Co., recently announced the addition of a new line of Stock Reels and Scrap Winders to their present line of Automatic Roll Feeds, Stock Straighteners and Scrap Cutters.

More than 25 different models are included. Reels are available in spoke or disc type, plain, automatic brake



or motorized spindles. A self-centering feature is available on most models. The capacities range from 150 to 1000 pounds. The reels can be tilted from vertical to horizontal, through an arc of 90°. They are supported on large cast-iron bases, adjustable for height. Adjustable stock guides are included on most models.

**The LaBahn Machine and Mfg. Co.**  
Dept. BB  
Menlo Park, N. J.

# MANUAL MAGNETIC SEPARATOR HAS 15-POUND CAPACITY

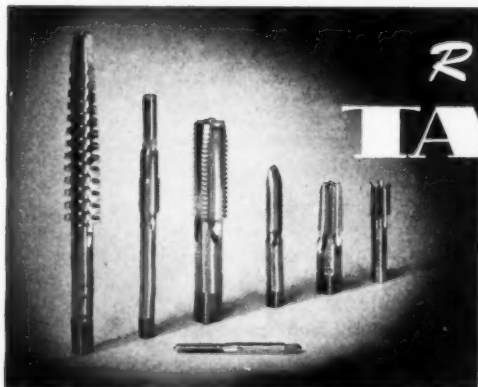
A load-releasing, light-weight, adjustable hand magnet of the permanent (non-electric) type has been introduced for rapid handling of steel. It is completely self-powered and requires no current, wires or batteries. The unit is operated with one hand and lifts up to 15 pounds. It instantly releases its load when a finger-tip lever is raised. Within the moisture-proof aluminum and stainless steel case are two 1/4-inch Alnico magnet which, it is stated, will not lose power, regardless of kind or length of use. Dimensions are 3" x 5 1/2" x 8"; weight 3 3/4 pounds.

The Multilift Model S Magnetic Separator saves both labor and material, as in removing steel parts from tumbling barrels; handling small parts; separating stacked steel strips; removing heat-treated parts from carbon; handling hot or cold parts; separating steel from non-ferrous materials of many

kinds and in salvaging steel parts or particles from assembly lines, etc. For complete information, write:



Multifinish Mfg. Co., Dept. 156-BB  
2114 Monroe Ave.  
Detroit 7, Mich.



## R & N TAPS

For your production Tapping job Reiff & Nestor Taps ground from the solid 18-4-1 steel after hardening are unexcelled.

You get the benefit of correct design, material and construction, plus the background of 37 years' experience in fine tool making when you buy R & N Taps.

Our new No. 8 — 109 page Catalog now ready. A request on your letterhead brings it to you.

Next time try R & N Taps.

### REIFF & NESTOR COMPANY

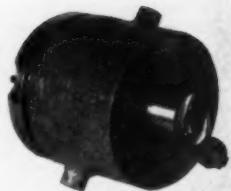
manufacturers of TAPS AND REAMERS  
LYKENS, PA.



### ERICKSON NO. 101-AT AIR CHUCK

The Model No. 101-AT, a recent addition to the Erickson line of air-operated chucks, has a range of 9/16" to 1/4" to increments of 1/32". This new chuck is adapted to many light machining operations, such as buffing, polishing, etc. It is alleged to be easy to operate, only a hand or foot valve being necessary.

One ingenious manufacturer is using this new size Erickson precision tool as a pick-off attachment on automatic grinding machines. The workpiece is held solidly in order that the cut may be completed without leaving a burr at the center. A standard type Erickson precision collet is used. Another application is the holding of thin-walled tubing firmly and without distortion, due to the uniform collapse of the collet throughout its length. For further details and applications on the Erickson No. 101-AT, write:



Erickson Tools Div., Dept. BB  
2309 Hamilton Ave.  
Cleveland 14, Ohio

### NEWLY DEVELOPED STEEL HAS HIGH WEAR RESISTANCE

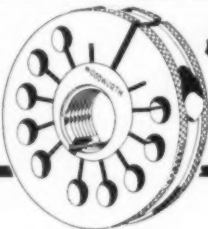
A new product T. R. S. "Tool Room Specialty Steel" is announced by The Amalgamated Steel Corp. Recognizing the need for a steel with high resistance to wear, toughness and strength with

ductility to resist fatigue, the manufacturer, after months of experimentation and over a year of actual shop use, has developed what their engineers feel is a solution to the problems of users of

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NO GO

GREEN—  
GO

Pat. Pending



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**THREAD  
RING GAGES**

No wonder more and more industries are adopting this gage as standard. Its revolutionary design assures wear life 5 to 7 times longer. And maintains accurate inspection. Just try the Woodworth Thread Ring Gage on your extra tough job—and you, too, will standardize!

Wire or write for folder No. 46R at no obligation.

**5-PLUS  
FEATURES**

- 1 Greater accuracy and stability
- 2 Longer wear life
- 3 Less weight
- 4 Positive identification
- 5 Positive adjustment

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YOU CAN TRUST**

# WOODWORTH

N. A. WOODWORTH CO., SALES DIVISION • 1300 E. NINE MILE ROAD • DETROIT 20, MICHIGAN  
COMPLETE LINE OF PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS



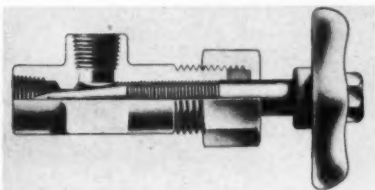
### Tool and Die Steels.

The product, a new balanced Alloy Tool Steel embodying the best features of oil, air, and water hardening steel, can be used for general purposes throughout Tool and Maintenance Departments, eliminating the need for large inventories of a variety of steels. Amalgamated Steel engineers claim it can be used on 80% of the jobs in average shops with better results. Inasmuch as T.R.S. steel may be quenched in oil, water, or salt bath, almost any degree of hardness may be obtained. It is claimed the new steel will not crack in heat treatment, welds readily, forges perfectly, and machines with an excellent finish. T.R.S. is available in Flats, Rounds, Squares, Hexagons, Octagons, and Billets in various sizes. A staff of experienced engineers is available for production problems, upon request to:

**Amalgamated Steel Corp. Dept. BB**  
Newburgh Mill District  
Broadway & Wire Ave.,  
Cleveland 5, Ohio.

### METERING VALVE EQUIPPED WITH MICROMETER PRECISION THREADS

The micrometer thread Metering Valve has been developed by the Carpenter Manufacturing Corp., designers and builders. The adjustments are claimed to be as delicate as a micrometer, having identical type threads.



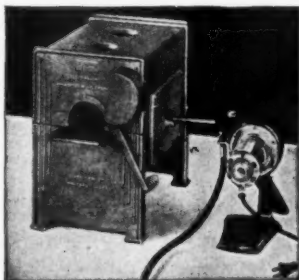
The valve is precision manufactured with a stainless steel stem, and solid brass bar stock body. The unit is available with pipe threads, straight threads, tube machinings or unions. It is guaranteed for 500 lbs. pressure in water, oil, or gas service. For detailed information:

**The Carpenter Manufacturing Corp.**  
9523 Detroit Ave., Dept. BB  
Cleveland 2, Ohio.

# "Stark"

## "ELECTROBLAST"

**High Speed Muffle Furnace**  
attains high speed heat  
in 20 minutes



**No. 1 Furnace, as shown, muffle opening 7 x 3 1/8 x 2 1/8" complete with independent blower or torch and metal gas hose. . . . . \$80**

**No. 2 Furnace, muffle opening 7x4 5/8x3 1/2" with built-in blower & gas hose. \$148.**

**Operate on city or tank gas for 7 to 10 cents per hour.**

**Built of best materials, they do high grade small work handily and efficiently**

**Adequate pyrometer equipment extra, if desired.**

*Write to us*

**Stark Tool Company**

Established 1862

**WALTHAM, MASSACHUSETTS**

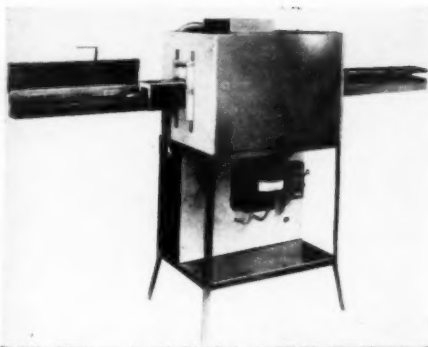
*Originators of the American Bench Lathe*

## NEW LOW PRICED TUNNEL KILN

A new tunnel kiln recommended for small batch production work, firing of ceramic parts, and heat treating of small parts on a production basis has just been announced by the K. H. Huppert Company, Chicago. Featuring an electric heating element providing a maximum temperature of 2200° F., this kiln is made ready for immediate operation by simply attaching the line to the fused switch box in the unit.

The new kiln is the pusher type, with small refractory trays being pushed through the inside of the 33-inch firing chamber by means of a variable-speed drive. The firing zone is actually 10 inches long, and the size of the tray is 2½" by 3¾". Pusher mechanism as well as provision for loading and unloading is self-contained. The over-all dimensions are 102" long x 62" high x 24" wide. The basic principles of this new kiln can readily be applied to larger construction.

Constructed of No. 14 gauge steel, the new kiln has a green Alpo baked-on enamel finish. Supporting framework is heavy angle iron. The entire unit's weight is 700 pounds, and it comes com-



pletely equipped with a No. 221 Wheelco Capacitrol for automatic temperature control, fused switch box and step-down power transformer. The kiln operates on single phase 110 or 220 volt a.c., and has a current consumption of two kilowatts Bulletin available from:

K. H. Huppert Co., Dept. BB,  
6830 Cottage Grove Ave.  
Chicago 37, Ill.

## NEW CUSHMAN CYLINDERS FOR POWER CHUCK OPERATIONS

The Cushman Chuck Co. announces a new series of high speed air cylinders, developed especially to meet the needs of advanced machine tool applications, and to assure trouble-free service under exacting conditions. Cylinder bodies are aluminum alloy forgings of high tensile strength, finished with lapped bores assuring an efficient air seal. After assembly, the cylinders are statically balanced to eliminate vibration at high operating speeds. The air ports are larger than in previous specifications, resulting in rapid movement of the piston, and speeding up the chucking work pieces on short operations.

The design and construction of the air seal consists of a piston fitted with a Graphitar disc, forming a positive seal with two annular rings that are integral with the end of the piston rod. A balanced air pressure is maintained in back of the piston, thus providing equalized pressure on both sides of the



air seal.

Cylinders will be available in 4½", 6", and 8" sizes. The cylinders have been in operation under exacting test conditions for several months, and are guaranteed to function satisfactorily at speeds up to 3500 r.p.m. Additional information is available upon request to:

The Cushman Chuck Co., Dept. BB  
Hartford 2, Conn.

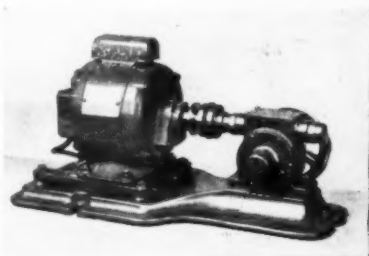
### WOOD BAND SAW CONVERTIBLE TO METAL

With the Speed Marvel Reducer, any wood cutting Band Saw using a 1/4 or 1/3 h. p. motor may be converted to metal cutting. The change-over may be accomplished in a minute. The unit is adaptable for either horizontal or vertical drive.

This reducer consists of a casting enclosing a bronze worm gear driven by a hardened steel worm and running in an oil bath. Both shafts run in oilless bearings. Both ends of the steel worm shaft are equipped with ball thrust bearings. The reducer is designed for operation with any 1/4 or 1/3 h. p. motor having a speed of 1800 r. p. m. or less.

The reducer is mounted on a base; The motor is mounted on the same base and connected through a flexible coupling, driving the reducer at 1725 r. p. m., the motor speed. This reducer gives a reduction ratio of 30 to 1. Consequently, the reduced speed becomes

57.5 r. p. m. at the Band Saw. With this speed, driving a 12" Band Saw, the cutting blade is traveling at a speed of 180 feet per minute. With the proper

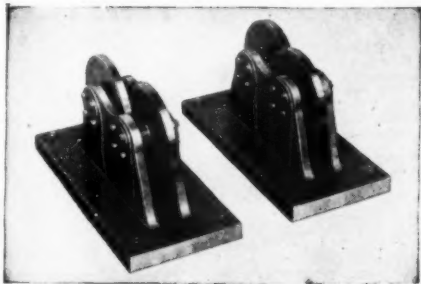


cutting blade, this speed will cut soft and low carbon steel, copper, brass, bronze, aluminum, etc.

**Hutchinson Mfg. Co., Dept. BB**  
Norristown, Penna.

## PILLOW BLOCK BALANCING WAYS

Especially suited for large diameter work, as a sub-base can be made of proper height to give necessary clearance for work. Anderson Pillow Block Balancing Ways are precision built with chilled iron discs which rotate with minimum friction on sensitive special bearings. Many manufacturers have endorsed them for profitable, efficient, static balancing.



**Built in 1000, 2000, 5000, 10,000  
and 20,000 Capacities**

Write for Bulletin S-5



**ANDERSON BROS. MFG. CO., Rockford, Ill.**  
Balancing Ways, Roto Checkers, Hand and Power Scrapers,  
Spotters, Hand and Power Hydraulic Straightening Presses.

## SCHERR aids to precision — production

### SCHERR MICROMETERS



have vernier readings to 1/10,000 at no extra cost, in 1", 2" and 3" sizes. This is right in step with modern demands for higher accuracy. Purchase now of these fine Scherr manufactured micrometers will insure against future obsolescence. Available in sizes up to 96". All Scherr micrometers offer these advantages: solid forged frames; easy reading graduations on thimble and vernier; longer life and more sensitive touch due to a burnishing process which compresses and polishes the surface of the thread; such refinements as ratchet stop to control the measuring pressure, and decimal equivalent markings on frame or barrel. Scherr micrometers are noted for their moderate prices. Write for bulletin and order the micrometers you need now. 1", \$8.25 — 2", \$9.00 — 3", \$9.75.

### GAGE BLOCK UTILITY SET



Quick adjustable type holders. Greatly expands the usefulness of any set of standard gage blocks. The complete set includes four holders—2", 4", 8" and 12", two jaws each for inside and outside measurements, a 60 deg. center point, a scriber point, and a substantial height gage base. Holders have no long projecting screws to make handling awkward. Every shop can profitably use one or more of these economically-priced sets, which will save their cost many times over by applying gage block accuracy at first hand, allowing for no variation through the use of any other tool. Any parts of this set can be furnished separately at moderate cost. Set, \$98.50.

### SINE BAR



Thoroughly normalized for undeviating accuracy. Two sizes — 1"x $\frac{1}{2}$ "x5" and 1"x1 $\frac{1}{4}$ "x5". Type G has ground edges. Type L, lapped edges. Extremely low price makes this valuable tool available for the individual owner as well as in quantity for the toolroom.

$\frac{1}{2}$ " Ground, \$19.00 — Lapped, \$26.00  
1 $\frac{1}{4}$ " Ground, \$26.50 — Lapped, \$36.50

Write for full details on these tools, and  
for the Scherr Small Tool Catalog

## GEO. SCHERR CO., Inc.

198 - Lafayette St. New York 12, N.Y.

### AIR PRESSES DELIVER 200 STROKES PER MINUTE

A contribution to high speed production is offered by the new Munton Air Press, illustrated, which delivers 200 strokes per minute. This press has been developed to reduce costs by means of speedy operation on such applications as riveting, forming, drawing light materials, and operations on all products requiring light, fast work.

Munton Air Presses are available in capacities of  $\frac{1}{2}$ , 1, and 2 tons, at 80 pounds air line pressure. They are built to stand up under high speed operation, due to their all-welded construction, with provision for overloads.



Characteristics include two-way cylinders with cushioned top and bottom, and a manually operated ram guide.

The press can be mounted on any bench; only facility required is a compressed air line. A stand and foot control can be furnished for floor use; available attachments are a silencer, speed regulator, and stroke control.

Munton Manufacturing Co., Dept. BB  
Franklin Park, Ill.



## NEW TYPE END MILL

3 FLUTE

2 For Hogging

4 for Finish

Three Flute does both.

Send For Catalog Jobber inquiries invited.

**Cadillac Cutter Co.** Grand Rapids  
7, Michigan

## Save Time With RADIUS DRESSER

Thousands of Somerset Dressers in service. Offer outstanding features—Wheel is dressed from below, avoids removal of guard. Stop pins permit rotation thru 180° or 90° either direction. Wear-resisting bearing is dustproof.



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**SOMERSET TOOL CO.**

420 Virginia St.

Hillside, N. J.

## NILCO DIAL BORE GAGE GIVES POSITIVE CONTROL

The Nilco Dial Bore Gage is a visible control, inside diameter indicator gage designed for rapid and accurate measurement of small internal diameters. The dial indicator reflects the size and condition of a hole. This device contributes to controlling accuracy and increases production in boring, grinding, and honing, of accurately conditioning bore diameters. It gives the operator and inspector positive control over the size and shape of the bore. The total weight of the Nilco Dial Bore Gage is only about eight oz. The dial indicator has graduations in .0001" with a total travel of about .008". Three Nilco Dial Bore Gages will cover a range of 3/8" to 7/8". It is simple to set with Jo-Blocks, and for short runs, master rings are not necessary. When the range is determined, fine adjustments to size on the indicator are made with a simple key arrangement which automatically seals the gage, so that when released to machine operators or inspectors, the gage can not be tampered with



or the indicator dial moved accidentally.

**Nilsson Gage Co., Dept. BB**  
Lake St.  
Poughkeepsie, N. Y.

## Faster Tube & Pipe Cutting

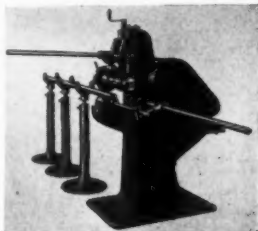
**S**TEEN High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters 1/8" to 3"; 1/2" to 6"; 3" to 12".

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1954 Maud Ave.

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**LONGER TOOL LIFE**  
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**AND AT  
 FAR  
 LOWER  
 COSTS**



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 COOLANT THAT  
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The word is spreading . .  
 a trial will convince you

*write - wire - phone*

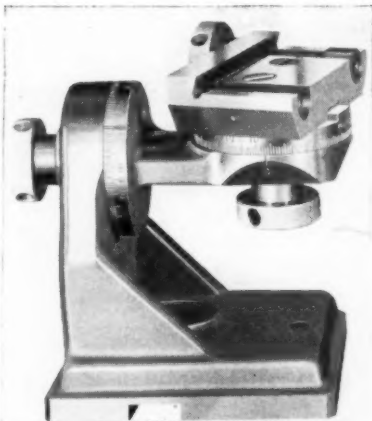
**F. E. ANDERSON  
 OIL COMPANY**

712 BROWNSTONE AVE.  
 PORTLAND, CONNECTICUT

#### **GRINDING ATTACHMENT FOR LANDIS CHASERS**

The new No. 15 Chaser grinding fixture provides a satisfactory method of grinding Landis Chasers. It is intended to be used to grind, on the Tangential chaser, the compound rake and lead angles, which are essential to the production of accurate threads.

Supported by the base casting is a crossarm, arranged so that the chaser platen can be adjusted vertically. This makes possible the grinding of any desired rake angle. The platen can be rotated throughout a 360° circle horizontally, providing an accurate means of producing the desired lead angle. Knurled knobs, fitted with pin holes for added leverage, hold the fixture in any adjusted position.



The device can be adapted for use on any grinding machine which has a traversing table, regardless of the type of grinding wheel it uses. The base of the fixture can be clamped to a T-slotted table or on a magnetic chuck.

This fixture can be used on all chasers up to 1-1/4" wide. It measures 3-1/4" square at the base, and 3-15/16" in overall height.

**Landis Machine Co., Dept. BB  
 Waynesboro, Pa.**

**HAMMOND FLEXIBLE BELT GRINDER-  
POLISHER A VERSATILE UNIT**

The new Hammond flexible belt grinder and polisher operates in both horizontal and vertical positions; it offers the various methods of abrasive belt finishing—free belt, contour, platen, and contact wheel. To adjust the machine for the desired method, the operator simply slips on an abrasive belt of the grit required to produce the desired finish.



The unit, Model VH-2, is available in bench or floor-type. It will accommodate abrasive belts 42" to 60" long, x 1/2" to 2" wide. The abrasive belt speed is 3000 s. f. p. m. Features include sealed ball bearings, positive belt tracking, with spring belt tension. The machine is equipped with a 6" diameter x 2" face muslin contact wheel; a 7" x 8" tilting table with machined surface, adjustable belt platen, motor sheave and V-belt, with guard. A 1/3 h. p., 1800 r. p. m. motor is recommended. The floor space required for the VH-2 is only 15" x 17". For complete details, write:

**Hammond Machinery Builders, Inc.  
Dept. BB, 1600 Douglas Ave.  
Kalamazoo 54, Mich.**

**\$ SAVE \$**

**NEW! • NEW!**

**• 18" VERNIER  
HEIGHT  
GAUGE**

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**ORDER TODAY!**

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128 Pages**



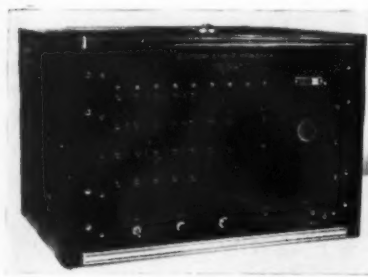
**EASTERN Tool Supply Co.  
174 Grand Street  
NEW YORK 13, N. Y.**

### INTERVAL TIMER COUNTER CHRONOGRAPH

For applications which require an extremely accurate time interval measurement, the new Model 450 Interval Timer manufacturer by the Potter Instrument Co., will measure intervals in steps of 0.625 microsecond

The instrument will register, directly, intervals up to 1 second. Longer periods can be recorded by using an external counter to record the number of times the cycle is repeated.

The Interval Timer is actuated by positive pulses which can be easily derived from detectors such as photoelectric equipment and closing contacts. The time base included in the instrument consists of a 1.6 Megacycle crystal oscillator. The oscillator, electronic switch and counter



decades are made up as individual units which plug into the chassis. Indication is by means of neon indicator glow lamps.

For complete details, write:

Potter Instrument Co., Inc., Dept. BB  
136-56 Roosevelt Ave.  
Flushing, N. Y.

### CROWN HEATING TORCH ENTIRELY SELF-CONTAINED

Over eight full hours burning time, 3800° F. operating flame, hand-size convenience, are features of the Crown Torch, a completely self-contained heating torch which burns Butane or Propane gas.

Made of 16 gauge seamless brass tubing, the Crown Torch has a pressure capacity of over 2200 psi. Operating pressure with Butane and Propane gases is 90 to 150 psi. The torch is 12" long, 2¼" in dia., and weighs 2½ lbs. when full. Other features include fingertip control of

flame size and temperature, a patented tip which eliminates the need for tip



changes, 100% B.T.U. efficiency, and easy filling operation. The Crown Torch can be filled from any standard Butane or Propane tank. For further information, write:

Sully Engineering Ltd., Dept. BB  
7416 Melrose Ave.  
Los Angeles, Calif.

### MINIATURE DILLON DYNAMOMETER

To measure tension or force in tight spots found in many types of mechanical assemblies, a miniature dynamometer has been developed, measuring only 3" in diameter; the instrument weighs 1 pound. It is available in 100, 250, and



500 lb. capacities; has an unbreakable lucite crystal and red indicator hand. Components are die cast of Zamac No. 3 alloy. A complete catalog will be sent on request to:

W. C. Dillon & Co., Inc., Dept. BB  
5410 W. Harrison St.  
Chicago 44, Ill.

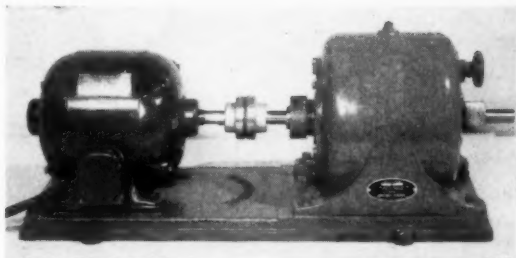


## HYDRO DRIVE VARIABLE SPEED UNIT

Infinite variable speed from zero to 1800 r. p. m., with constant torque throughout the range; immediate speed corrections merely by rotating the control knob; automatic reverse with the motor, and operation in any position, are among the advantages stressed for the Hydro Drive Variable Speed Unit.

Other features include compactness, ability to absorb shock loads, smoothness of speed changes and simplicity of operation. All gears, belts and chains are eliminated and there are only two moving parts.

Hydro Drive is offered complete as a unit with motor, base and coupling, or the unit may be coupled to your



present motor. The manufacturer offers complete literature and special cooperation on problems involving variable speed transmission applications.

Hydro Drive Co. of America, Dept. BB  
8827 Miner St.  
Los Angeles, Calif.

## McGILL'S DRILLS - Solid and Carbide Tipped



**Complete  
Lines**

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Right**

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# McGILL CARBIDE TOOL CO.

4612 Woodward Avenue

Detroit 1, Michigan

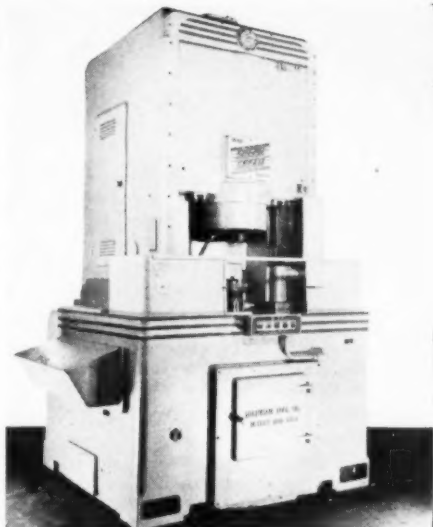
## MICHIGAN SHEAR-SPEED CUTS GEARS TO 10" O. D.

A new Shear-Speed external shaper, Model 18103, illustrated, capable of cutting gears, toothed clutches and other external shapes up to 10" o. d. and 2-3/4" thickness has been added to its line by Michigan Tool Co.

The machine takes a floor space 86½" x 78½", and is 123" in height. Powered by a 30 h. p. electric motor, it will handle work from 7" to 10" in o. d.; with special liners it will take work as small as 5" in o. d. Maximum stroke on the machine is 3 inches.

It is recommended for gears or involute splines from 5 pitch to 12 pitch. The unit cuts all teeth simultaneously. It will also cut straight sided splines, sliding clutches, ratchets, inverted splines and other external shapes. These can be cut individually or stacked and cut in multiple units where this is feasible.

A new feature is the method of automatically locking the head in cutting position. Hydraulic actuated wedge pins provide instantaneous locking of the head when it is lowered in cutting position by engaging a similar angular wedge surface on the two outer extremities of the head of the machine. Angle of the wedge surface on both the pins and the corresponding wedge surfaces on the head allow locking in the desired cut-



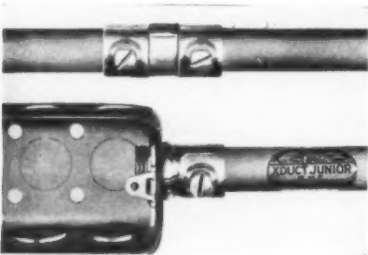
ting position with only a simple initial adjustment of the head stop. This reduces the time required for adjusting vertical cutting position to a minimum.

For additional information write:

**Michigan Tool Co. Dept. BB**  
7171 E. McNichols Road  
Detroit 12, Mich.

## U. L. APPROVED COUPLINGS FOR ELECTRICAL METALLIC TUBING

A new line of pressed steel connectors and couplings designed and fabricated



for use with electrical metallic tubing has been made available by National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh. Approved by Underwriters Laboratories, Inc., the new products have electro-galvanized finish and are said to be particularly useful in close quarters and on corner installations. The E.M.T. Coupling, shown at the top, slips over thinwall tubing ends in a close, accurate fit. Positioning of the conduit is controlled by a small integral stop. A typical installation of the E.M.T. Connector is shown below the coupling.

## OPTICS FOR GRINDING

*Check* YOUR CARBIDE  
TOOL ANGLES

with



**OPTI-CHECK**

- Magnifies Tool
- Magnifies Reading
- No Fussy Juggling
- Accuracy  $\frac{1}{4}$  Degree
- Makes Duplication of Sharpening Angles Easy.
- Checks Drills, Cutters, etc.

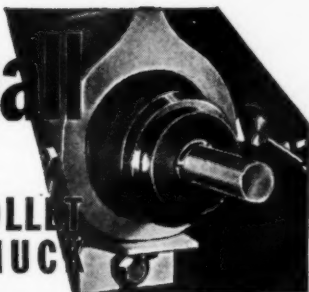
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**THE BENTON CO.**

DEPT. H 351 S. LA BREA, LOS ANGELES, CALIF.

# hal

## COLLET CHUCK



**SPEED UP** production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-inch capacity, \$145; 3-inch capacity, \$295;  
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Round, square or hex collets, plain-serrated  
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**T. H. LEWTHWAITE MACHINE CO.**  
312 East 47th St., New York 17, N. Y.

## ELECTRICALLY HEATED CHEMICAL CLEANER FOR INDUSTRIAL USE

A portable electrically heated Chemical Cleaner that may be used for on-the-spot indoor cleaning of industrial machinery, conveyor systems, and other equipment in factories is being manufactured by Hartman Corporation of America, St. Louis. Among its advantages are a constant-pressure anti-splash spray nozzle which automatically regulates the spray pattern for high temperature clean-



ing, and creates a high-powered pulsating stream of atomized super-heated water and chemical solution for cleaning and flushing; all injurious fumes, vapors and chemical-laden steam are eliminated, protecting highly polished surfaces, and preventing clouds of steam that endanger the operator.

Other features are a ceramic core boiler fitted with an immersion heater that heats tap water to operating temperature in approximately one minute; patented Thermo-Flo Valve that maintains uniform water temperature; automatic solution shutoff which prevents operation when chemical tank is empty; temperature cutout switch that cuts off current when water temperature rises above operating level; self lubricating water and chemical pumps; and an air-cooled nozzle handle.

The Hartman Electrically Heated Chemical Cleaner is built into a waist-high cabinet occupying less than a 2-ft. square of floor space. It is equipped with 10" heavy pneumatic rubber tires, swivel

caster with brake for maximum maneuverability, 20-foot Neo-prene high-pressure grease-resistant hose, and sufficient heavy duty rubber cable to provide an 80-foot working area.

**Hartman Corp. of America, Dept. BB**  
5147 Natural Bridge Ave.,  
St. Louis 15, Mo.

## SKYLIFT TRUCK STACKS TO 130"

This materials handling unit is a recent development of the Automatic Transportation Co., which claims that the truck has the highest lift of any fork truck designed with a standard 83" collapsed height. Called the Skylift, the truck will stack boxes, cartons, or materials to a distance of 130" (10 ft. 10 in.) from the floor to the top face of its forks. The unit is also capable of stacking to ceiling heights in low-clearance buildings or box-cars.



The Skylift is equipped with independent hydraulic rams which raise each section of the telescopic lift. The forks and uprights thus move independently of each other, the forks raising to the top of the uprights before the latter begin to extend. Complete information on the Skylift and other materials handling equipment is available upon request to:

**Automatic Transportation Co.**  
Dept. BB, 159 W. 87th St.  
Chicago 20, Ill.

CLOSED



TRADE



AUTOM

CLOSED



MARK

PLAIN TYPE



OFFSET TYPE



## CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

THREE-FOURTHS OFFSET.



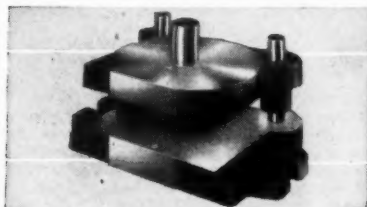
**AUTO MOULDING & MFG. CO.**

**1110 E. 87TH ST.**  
**CHICAGO 19, ILL.**

**SPECIFICATIONS:**  
Open Width  $\frac{1}{8}$ " to 6"  
Gate Material .040 to .125  
Pin Diameter .101 to  $\frac{1}{16}$   
Lengths to 120"

SEMI-OFFSET





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### PRECISION DIE SETS

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## DOWEL PINS



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Standard Size Dowel Pins from  $\frac{1}{8}$ " to 1" diameter and from  $\frac{3}{8}$ " to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

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| <ul style="list-style-type: none"> <li>• Micrometers</li> <li>• Verniers</li> <li>• Gear Tooth Verniers</li> <li>• Adj. Snap Gauges</li> <li>• Levels</li> <li>• Cubes</li> </ul> | <ul style="list-style-type: none"> <li>• Indicators</li> <li>• Height Gauges</li> <li>• Squares</li> <li>• Bevel Protractors</li> <li>• Surface Plates</li> <li>• Carbide Tipping</li> </ul> |
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EST.  
1926



# METRON ELECTRIC HAND TACHOMETER

Multiple range electric tachometers are now available as hand instruments for general purpose speed measurements in



either revolutions per minute or feet per minute. With an accuracy of 1%,

three separate ranges are provided on a 100 division,  $\frac{3}{8}$  inch scale. Type 25A tachometer has ranges of 200 to 2000 RPM, 500 to 5000 RPM, and 1000 to 10,000 RPM. Type 25B tachometer is for low speeds and has ranges of 20 to 200 RPM, 50 to 500 RPM, and 100 to 1000 RPM. The desired range is selected by means of a switch; no damage can result from selection of an improper range, changing ranges while in operation, or from over-speeding.

The tachometer head is connected to the indicator with an electric cable so that no vibration from the rotating part reaches the indicator, thus readings are steady. The spindle on the head is the only rotating part and it is mounted by permanently lubricated ball bearings.

Speed adapters are available for extending the measuring speed ranges of these instruments up or down by a factor of 10 to 1. The Type 25A with a high speed adapter can be used to measure speeds as high as 100,000 RPM, and the Type 25B with a low speed adapter will measure speeds as low as 2 RPM. The adapters slip readily over the head of the tachometers and actual speeds are

## VERSATILE! MATCO *All-Angle* VISE

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Available in  $3\frac{1}{2}$ " and  $4\frac{1}{2}$ " sizes

[Arrow, in illustration, points to precision angle adjustment screw.]

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432 Lincoln St.  
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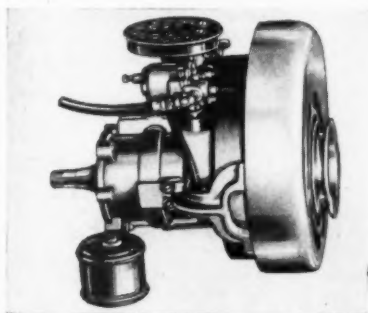
#### LIGHTWEIGHT GAS ENGINE STRESSES SPEED AND LONG LIFE

Production of a new lightweight Mono-cycle Engine, capable of developing 2 to 3 h.p., has been announced by Sensation Engine Co. The Sensation Mono-cycle Engine, weighing only 18 lbs., is built of light weight metals, and embodies fewer parts than any other gasoline engine, according to its manufacturer. It is able to deliver much greater horsepower per pound of weight. The engine will operate in horizontal or vertical position or at any angle in between.

The Sensation Engine running on test has reached an endurance of 3600 hours at speeds varying from 3200 to 4500 r.p.m., pulling a 1½ h.p. constant load. The engine uses a fuel mixture that assures easy starting even after flooding, provides perfect lubrication and prevents carbon difficulties. Its full ballbearing

crankshaft is counterweighted to reduce vibration and wear. Needle bearings are used on a steel connecting rod.

The engine can be used on air compressors, feed mills, and other types of equipment where high speed, dependability, and long life are essential. For complete information, write:



Sensation Engine Co., Dept. BB  
Omaha, Neb.



Manufactured by  
ESCO ENGINEERING  
CORP., Cleveland 12



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## INGERSOLL RAND COMPACT ELECTRIC TOOL KIT

A new portable electric tool kit containing a tool which will accomplish several jobs, is announced. Featured is the new light-weight impact tool, with standard accessories (described in detail in the Aug. 1947 Machine and Tool Blue Book). By using the proper accessory, the operator can drill steel, masonry and wood, apply and remove nuts, ream, wire brush, tap, apply and remove studs, drive and remove screws, extract broken cap screws and studs.

The kit is assembled complete or with accessories, as required. With standard equipment, the kit contains the impact tool with a Jacobs collet type chuck, six hex sockets, a Morse Taper socket, and adapter sleeve. Also included are screw drivers and quick change chuck, square Phillips and Reed and Prince bits, together with a screw driver adapter for these bits.



The impact tool is the only Universal motor driven, all-purpose tool employ-

ing the impact mechanism. It runs as any conventional electric tool until the

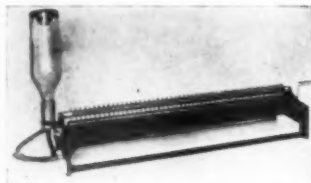
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**FOSTER ENGINEERING CORP.**

**4200 Woodward**

**Dept. P**

**Royal Oak, Mich.**



going gets tough. Then the impact mechanism automatically functions and delivers 1900 rotary impacts per minute to the job.

**Ingersoll Rand Co., Dept. BB**  
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New York 4, N. Y.

#### **NEW DIE SETS FEATURE ANTI-FRICTION CONSTRUCTION**

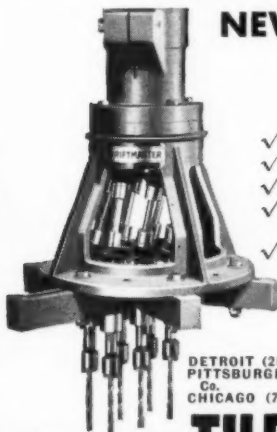
The new Acrolex Die Set, announced by the Evans Reamer and Machine Co., manufacturers of the Microflex Precision Die Sets, has been designed to include all the features of anti-friction construction at low cost. Advantages claimed for the new unit include preloaded anti-friction ball bearings between the leader pins and bushings to prevent lateral motion. The sets are provided with easy opening and closing by manual operation. The lubrication is simple and positive; the dies are said to have long life, with more production between die grinds.

In introducing the Acrolex, R. J. Hall, Evans Sales Manager, has estimated

that the unit will give excellent performance in 90% of all production runs. For complete information, write:



**Evans Reamer & Machine Co.,  
Dept. BB**  
New Lexington, Ohio



## **NEW ADJUSTABLE DRILLHEAD**

*...by Thriftmaster*

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- ✓ Universal Joint drive.
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- ✓ Made for right hand rotation of drill press.
- ✓ Sufficiently rugged for use with power feed.
- ✓ Rated at full capacity of 1/4" drill in steel.
- ✓ Furnished with 2-6 spindles, minimum 1 1/2" center spacing within 6 1/4" diameter circle.

For complete engineering information, write to:  
Engineering Department, Thriftmaster Products Corporation  
1048 N. Plum. St., Lancaster, Pa.

DETROIT (21) B. E. Parish Company  
PITTSBURGH (16) Voss Machinery Co.  
CHICAGO (7) Gatz-Arnold Company

BOSTON (16) A. R. Shevlin Company  
PHILADELPHIA (40) Wright & Gade Tool Co.  
INDIANAPOLIS, R. L. Guilmet Co.  
CLEVELAND (12) T. J. Fraser Tool Supply Co.

# **THRIFTMASTER**

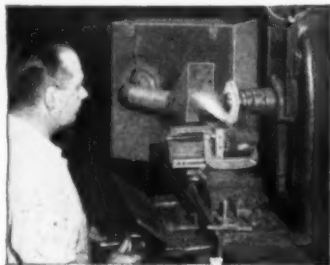
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## VERTICAL SPINDLE LATHES HAVE 100-4800 RPM RANGE

These new Vertical Spindle Variable Speed Lathes are designed for general secondary finishing operations, such as deburring, filing, or polishing metal and plastic parts, where, because of the shape of the part to be finished, or the nature of the operation, it is advantageous to revolve the work piece in a horizontal plane. They are available either manually or air-operated, and arranged for various holding devices, including standard 3-jaw chucks, air-operated chucks, collets, expanding mandrels or special holding fixtures.



Spindle speeds from a high of 4800 r.p.m. to a low of 100 r.p.m. are provided, in a 6 to 1 ratio when using a single-speed motor, or 12 to 1 with a two-speed motor.

Continuously operating motor, automatic chuck and brake, and other standard features incorporated in Schauer Speed Lathes provide faster finishing, increased production, and decreased spoilage, according to the manufacturer. For complete specifications on these new Vertical Spindle Variable Speed Lathes, write:

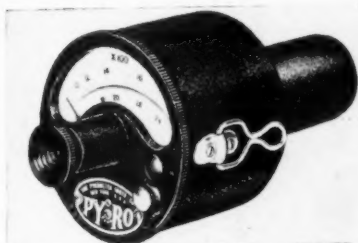
**The Schauer Machine Co. Dept. BB,  
2064 Reading Road  
Cincinnati 2, Ohio**

## NEW PYRO RADIATION PYROMETER

The new Pyro Radiation Pyrometer has been designed to meet the requirements for a quick and accurate method to determine temperatures above 1000° F. by thermo-electric principles. This instrument is completely self-contained, is direct reading and requires no outside connections, batteries or other accessories. Pyro Radiation is automatic in its operation and requires no skill in its use. It is only necessary to sight the instrument at the object being measured and read the temperature on its direct reading scale. The special indicator locking-device holds the pointer at the reading obtained until a button is pushed, permitting the indicator to return to its zero position.

The operation of the Pyro Radiation is based upon the established laws of radiant heat. A very sensitive vacuum thermocouple within the instrument is sighted at the object being measured and the resultant electro-motive force operates a galvanometer calibrated in direct degrees of temperature. The instrument is constructed in a steel housing

making it not only durable but also immune to external magnetic and electrical influences.



Pyro Radiation finds application whenever spot temperatures above 1000° F. are to be measured quickly and accurately such as in all types of furnaces, forgings, fire boxes, kilns, retorts, etc.

Further data available from:

The Pyrometer Instrument Co. Dept. BB  
103 Lafayette St.  
New York, N. Y.



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### METAL CLEANERS

Discusses solvents, emulsions, alkaline powder or paste. Determination of cleaning problem such as type and composition of work to be cleaned, nature of soil to be removed and degree of cleanliness required. Removal of paint, rust and carbon soil. 4 pages. **F. E. Anderson Oil Co., Dept. BB, Portland, Conn.**

### HYDRAULIC CYLINDERS

Construction features. Line drawings and dimensions of complete line of standard hydraulic cylinders. Discussion of area volume and velocity chart and area force and pressure chart. Equipment and services available. 26 pages. **Hydro-Line Mfg. Co., Dept. BB, 711 Nineteenth St., Rockford, Ill.**

### PIPE AND TUBE MILLS

Describes Tube Mills for transforming strip steel into tubing. Discusses operation of the equipment, illustrates medium wall tube mill and gives brief specifications. 4 pages. **American Electric Fusion Corp., Dept. BB, 2602 Diversey Ave., Chicago 47, Ill.**

### STEAM TURBINE UNITS

Illustrations of standardized units and cross section drawings. Data on their ratings, capability and pressure and temperature limitations. Features and accessories furnished with the standardized turbine, the air-cooled generators, and standardized units' excitation system. 16 pages. **Allis-Chalmers Mfg. Co., Dept. BB, Milwaukee, Wis.**

### WELDING FITTINGS AND FLANGES

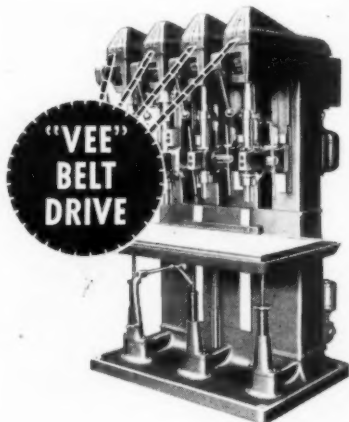
Dimensional data include wall thickness, return bends, stub ends, caps, outside diameters of concentric and eccentric reducers. Folder. **Taylor Forge & Pipe Works, Dept. BB, P. O. Box 485, Chicago 90, Ill.**

### OBITUARY

Charles A. Olson, Tool Superintendent at the Gisholt Machine Co., Madison, Wis., died after a short illness in January. Mr. Olson was 67 years old, and had been with Gisholt for 42 years. During that time he was closely associated with tool design and tool purchasing.

### AVEY MULTIPLE DRILLING UNIT WITH VEE-BELT DRIVE

The Avey Drilling Machine Co. is new including a vee-belt Drive on their Type BMA-6 drilling machine. This vee belt is used on the final drive from gear box to spindle, carrying the full horsepower from the motor to the job. Each spindle of the BMA-6 is individually motor-driven by a standard frame constant speed motor. This machine also is provided with six speed changes which are accomplished through selective sliding gears, enabling the operator to shift speeds quickly and easily. This automotive type gear shift is controlled by a single lever at the front of the machine.



The Avey Type BMA-6 illustrated is a four spindle unit with a twelve inch overhang. The first spindle is the Avey-matic feed. The second spindle is a plain power feed. The third spindle is hand feed, and the fourth is designed for tapping (reversing motor).

**Avey Drilling Machine Co.  
Engineers Dept. BB  
Cincinnati 1, Ohio.**



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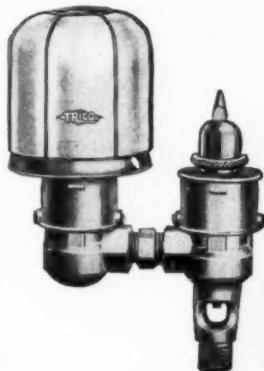
## MILWAUKEE

## DIE FILERS PROFILE GRINDERS

### TRICO GRAVITY-FEED UNIT FILTERS OIL

Here is a new precision oiler for solid bearings where an accurate rate of feed and clean, filtered oil are essential. The unit maintains an accurate constant level in the gravity feed mechanism. This uniform level is the feature which assures an accurate rate of feed regardless of amount of reserve oil in the bottle. Dirt cannot reach the bearing or clog the needle valve, since the oil is thoroughly filtered through the patented removable filter.

The Oiler is mounted at the top of the part to be lubricated and any predetermined number of drops of oil can be obtained by a simple adjustment of the needle valve. After the adjustment is made, no further attention is required except to keep a reserve supply of oil in the large capacity bottle. The shutoff lever, when in a vertical position as shown, feeds oil, when tilted to the side, stops the flow and when held at a 45° angle, it flushes the bearing which is desirable before starting machine.



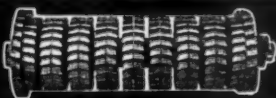
Trico Fuse Mfg. Co.  
Dept. BB., 2948 North  
5th St., Milwaukee, Wis.

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### **DIAMOND TOOL INCREASES WHEEL DRESSINGS**

This cluster type Diamond Dressing Tool (available in two styles, R 20 and R 20-15) has twenty small diamonds symmetrically inserted in a matrix and arranged in two circles of ten diamonds each. The inner circle is staggered in comparison to the outer, and the diamonds have been selected for their long, narrow form.

The R-20-15 tool is designed with two circles of diamonds set at a 15° angle. When dressing the wheel, three to five diamonds contact the wheel; after they become worn, the tool is turned 45° to expose new points. This procedure is repeated until all diamonds are worn beyond use and the tool is discarded.

When dressing the wheel, the diamonds even if worn to the end will not broaden out and develop large flats; hence, the tool is serviceable until the diamonds have been used up.

**Clipper Diamond Tool Co., Inc.**

21 W. 46th St., Dept. BB  
New York 19, N. Y.



### **NEW IDEAL ELECTRIC ETCHER**

Any product made of steel, iron, or their alloys, can be quickly and easily marked with a new electric etcher, the "Universal", manufactured by Ideal Industries, Inc. Regardless of the hard-

ness of metal, it burns into the surface making a smooth and permanent mark. The unit is enclosed in a metal case for ready portability. When opened, the cover forms a work plate on which



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... instead of 3 ordinary tappers to tap  
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### **Plus Additional Advantages**

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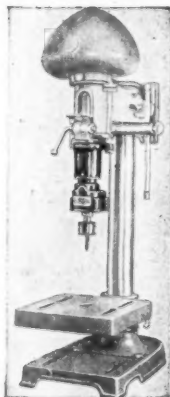
2-A Cap.  $\frac{3}{8}$ " to  $\frac{7}{8}$ " in Steel. 3-A Cap.  $\frac{1}{2}$ " to  $1\frac{1}{4}$ " in Steel.

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can be used in all sizes Dorman Tappers.

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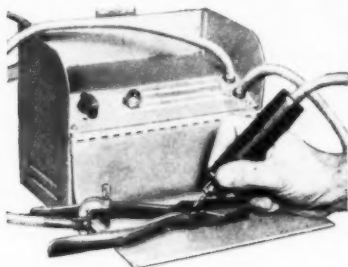
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to place small tools and parts for etching. A "C" clamp is furnished for use when etching parts that are too large for the work plate.

The etching tool does not overheat, because the point is so mounted in the handle that cooling air can circulate



around it. Four etching heats, 120, 240, 420 and 700 watts, make this tool useful for marking permanent identification on tools and instruments, etching names on products, marking stock, part numbers and sizes, model, voltage or other information. For further details, write:

Ideal Industries, Inc., Dept. BB  
Sycamore, Ill.

#### **BELTFLEX CONTACT WHEEL POLISHES ABRASIVE BELTS**

A new contact wheel called "Beltflex", for abrasive belt polishing has just been announced by Divine Brothers Co. It is designed to eliminate the necessity of using buff sections under abrasive belts. The Beltflex Wheel has the advantages of the buff sections, plus controlled balance and density, and a smoothly ground surface, which allows uniform belt tracking.

The Beltflex Contact Wheel is available in two degrees of density—one, type "E", offering great flexibility; the other, type "G", providing flexibility with aggressive cutting action. Beltflex Wheels are balanced to run smoothly and to give constantly accurate pressure to the working surface. Face widths and diameters for most requirements are available. They are recom-



A powdered abrasive prepared especially for applications where fine lapping, perfect control and freedom from imbedment (charring) are imperative.

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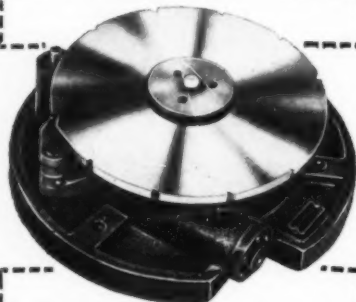
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Special Index Plates available with from 8 to 40 notches. 12-position is standard.

**MODEL B—** will automatically index with speed adjustable from 1 indexing each half second to 1 each ten seconds.

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No. 7¼-B — (specifications same as 7¼-A). **\$155.00**

No. 11-B — (specifications same as 11-A). **\$205.00**

**ACCESSORIES —** specially designed for use with Allen Dial Feed Tables

- \* Air-operated down clamps and side clamps with 4X power factor are available for holding the work piece.
- \* Knockout for ejection of the work piece from the index plate.
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Exclusive manufacturers of Dial Feed Tables  
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Brooklyn 18, N. Y.

mended for use with J weight (jeans cloth) abrasive belts. Write for further information to:



Divine Brothers Co., Dept. BB,  
200 Seward Ave.  
Utica 1, N. Y.

## WET ABRASIVE BAR AND TUBING CUTTER

The new Campbell Model 223 Bar Cutter is a hand operated wet abrasive cutting machine designed for fast, high quality cuts on most types of materials up to 2" diameter solid stock, and 3-1/2" diameter tubing. The unit features a 5" wheel flange, wheel guides, automatic work stop, automatic coolant pump operation, automatic hydraulic work clamp. All interior parts are cadmium plated.

A completely separate, wheel mounted coolant tank permits easy removal for chip cleaning; separate compartments settle out the sludge and keep the coolant at suitable temperature. Gusher type pump is completely automatic. Campbell distributor unit is so constructed that coolant is distributed over the wheel, resulting in straighter cuts, cooler cutting and extended wheel life.

Andrew C. Campbell Div., Dept. BB  
American Chain & Cable Co., Inc.  
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Metal-Cutting  
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TOOLS, BLANKS, and MILLING CUTTERS



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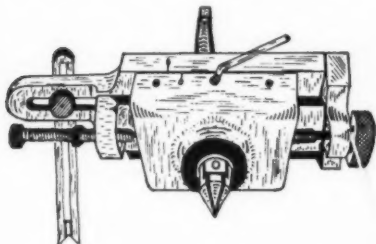


Our service on small gears, due to new equipment recently installed, will interest you. Send samples or blueprints for quotation.

**ATLANTIC GEAR WORKS, INC.**  
198 Lafayette St., N. Y. 12, N. Y. CANAL 4-1441

#### QUICK ADJUSTMENT TAPER CUTTING ATTACHMENT

An ingenious new taper cutting attachment, the Model 400, equipped with a rapid adjustable center for setting a lathe for taper cutting, has been developed. With this device, the manufacturers claim that no resetting of the



tailstock is necessary, and burned centers resulting from misalignment are avoided. The 400 saves time and tedious resetting of the tailstock for accurate straight turning.

The unit is simple to put to use: the operator inserts the device in the tailstock, the work piece is placed between the centers, then the tool bit is mounted in the holder, as usual. The tool is run up against the work. The compound is left set in this position, and the carriage is run toward the tailstock until the tool is clear of the work. The work is then removed from the centers, and the end of the scale is placed on the cutting edge of the tool bit, and the hand wheel turned until the point of center is at the desired scale reading. The center is then aligned in offset with the center line of the work. When the setting operation is complete, the device is taken out, and the lathe is ready for straight turning.

The device is available in Nos. 2 and 3 standard Morse taper shanks.

**Douglass Distributing Co., Dept. BB**  
3615 S. Grand Blvd.  
St. Louis 18, Mo.

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Throughout your plant it pays to know "how much" or "how many". Productimeters installed on your machines at production, assembly, or points of shipping insure an accurate count on every operation. They eliminate all guesswork and resultant losses.

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### FOR EXACT MACHINE SETTINGS

Clear-cut Productimeter figures can be used to indicate machine settings in thousandths on presses, lathes, milling and other machines. Proper settings can be made quickly and accurately, cutting unproductive setup time to a minimum.

Send for catalog 100 — over 300 models to choose from.

### DURANT MFG. COMPANY

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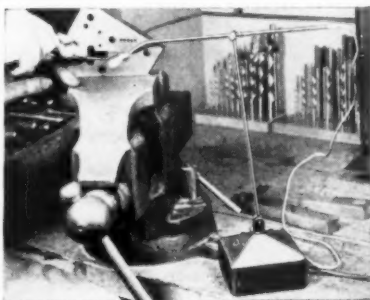
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Providence 3, R. I.

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*Speedometers*  
**SINCE 1879**  
**OF INDUSTRY**

### UNEEDA ADJUSTABLE INSPECTION LIGHT

A recently developed device for precision workers and inspection departments is the Uneeda adjustable light. It is equipped with an adjustable arm which extends 20", yet is only 3/16" in diameter, enabling it to be inserted into hard-to-reach spaces. The device can be placed in any desired position by hand, in order to concentrate a beam of white light on the work; it is provided with a 4-inch square bakelite base.



The Uneeda is useful for spot-lighting close precision and milling operations on the inside of dies, drawing scribing lines, die filing, and engraving. Inspectors find the Uneeda Light a valuable accessory in locating metal mlaws, burrs, and similar defects.

Twentieth Century Mfg. Co., Dept. BB  
3722 Montrose Ave.  
Chicago 18, Ill.

### FONDA SQUARE LIFETIME CARBIDE GAGE BLOCKS

A complete series of square style gage blocks has been added to its line of Lifetime Carbide Gage Blocks by the Fonda Gage Co. These blocks are manufactured in Grade "AA" (plus or minus .000002"), Grade "A" (plus or minus .000004") and Grade "B" (plus or minus .000008") quality, and include the full range of sets and sizes which have been heretofore available only in the rectangular Lifetime Carbide Blocks.



Besides the standard sizes, special sizes are also available in ranges from .010 to 4.000". Complete sets consist of 35 and 82 pieces.

**The Fonda Gage Co., Dept. BB**  
55 Daly St.  
Stamford, Conn.

#### PRODUCTO SELF CENTERING SHAFT VISE

A new method of expediting production with a Self Centering Vise, which may be mounted for both vertical and horizontal use is announced. It holds shafts or spindles 3/8" to 3-1/8" dia. in 4 1/4" jaws for machining keyways, slots or splines. An accurate right and left hand thread on the operating screw insures equal movement of both jaws (with special hardened plates) for clamping and centering the work in hardened Vee blocks.

Vertical base dimensions are 8" x 5 1/2"; horizontal base, 8" x 7 1/2"; maximum height including screw and hand wheel, approx. 13 1/2"; weight 80 lbs. Complete information on this "Vise of a hundred uses" from the manufacturer:

**The Producto Machine Co., Dept. BB**  
980 Housatonic Ave.,  
Bridgeport 1, Conn.

## NOW! A Compact, Low-Priced Vertical Milling Machine!

**The No. 1 Dodge Vertical**

This new and practical machine can handle virtually any job. It's easy to operate — with sensitive accurate control. Takes up only 18"x 15" of space and can be easily moved from one part of shop to another.



- Fast and accurate; runs smoothly, quietly
- Easy to manage and manipulate for plain or intricate work
- Capacity: 1/2"
- Rugged construction; long life
- LOW IN PRICE

68" high; weighs approx. 365 lbs. Size of table, 15"x4 1/4". Equipped with 1/3 h.p. single phase motor, 1750 R.P.M., swivel graduated head, Timken Bearing spindle. Other features! Price complete with 1/3 h.p. Single Phase Motor

**\$375.00**

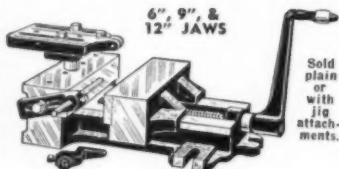
EXTRAS AVAILABLE: 6" rotary table; 4" swivel graduated vise.

Send for complete information.

### Allied Machinery Co.

**PH. FRANKlin 9875 548 W. Monroe**  
Chicago 6, Ill.

## Look at the jobs this Vise will do!



### GRAHAM Multi-Purpose Vise

First, a beautifully efficient plain vise, with flush, parallel and square construction, accurately finished. Second, a many-purpose jig or fixture for positioning plain, round and irregular shapes, with stops and guides, for use on planer, shaper, miller, grinder, drill press, radial. Sizes up to 124 lbs.



Request Bulletin 41

### "Adjust-angle" Knurl Holder

Many patterns  
using only  
straight knurls



On work up to 2½" dia., this Knurl Tool produces a variety of straight, spiral and diamond patterns, using only straight knurls. Shank made to fit your turret (or lathe tailstock). Equipped with Passing-over-stock feature if desired. Graduated adjustment of knurl angle.

For prices and details request  
Bulletin 41

### GRAHAM MFG. CO.

50 Bridge St. East Greenwich, R. I.

### ADD-A-SECTION STEEL BELT CONVEYOR

The new Flex-E-Unit Steel Belt Conveyor is composed of a head, or drive section and a takeup section at the opposite end. Each basic section is five feet long and when combined they form a 10 ft. all-steel conveyor. This can be lengthened to as much as 175 ft. by adding 4 or 5 ft. sections between the head and takeup ends. Combinations of the 4 or 5 ft. sections bring about any desired length of conveyor.



When assembled the Flex-E-Unit provides a solid, moving table. Heavy-gauge steel flights and chain are one integral unit for smooth operation at any speed within the range. The conveyor is resistant to heat and is capable of handling exceptionally heavy loads. It is made in 4 widths from 12" to 36" wide; in either 3" or 6" pitches. It is rated at 30 f. p. m.

Sermat Conveyor Corp., Dept. BB  
2350 W. 58th St.  
Chicago 36, Ill.

#### GUILD SAW

Describes features—made of die-cast aluminum alloy, has universal motor and high-quality ball bearings, blade protected, etc. Details uses by description and illustrations. Specifications. 2 pages. Porter-Cable Machine Co., Dept. BB, Syracuse 8, N.Y.

#### DATA SHEET

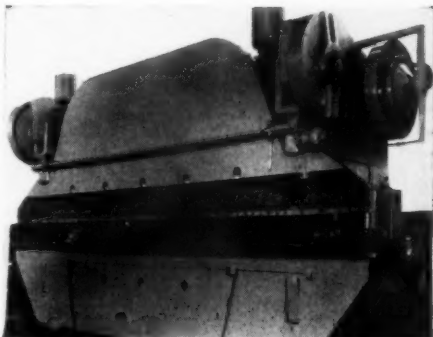
Individual requirements for consumer to fill in. Makes ordering taps handy. 1 page. The Charles L. Jarvis Co., Dept. BB, Middletown, Conn.

#### GIANT PRESS BRAKE WILL BEND THIRTY-FOOT SECTIONS OF 3/4" PLATE

The huge Cincinnati Press Brake illustrated at the right is believed by its manufacturers to be the largest two-housing mechanical Press Brake ever constructed. It has a clear span between housings of 21'6", and an overall die surface of 30'. The throat opening in the housings is 24". The unit was developed for use in a ship building yard.

The steel plates from which the main machine members were fabricated include housing plates 10'4" wide by 15'6" long by 8" thick, weighing 53,000 lbs. each. The ram plate was 7" thick by 112" wide by 30' long, and weighed 78,500 lbs. The bed plate was 7" thick by 108" wide by 30' long, and weighed 71,500 lbs. The gross weight of the completed machine is approximately 300,000 lbs.

This machine is capable of bending 30' of 3/4" plate over an 8" die opening and heavier plate of shorter lengths. It can be used for multiple or gang



punching as well as for bending. For further information, send for catalog B-2A, describing the complete line of Cincinnati Press Brakes.

The Cincinnati Shaper Co.  
Dept. BB  
Cincinnati, Ohio.



**MATTICKS MANUFACTURING CO.**

Specialists in Plastic Hammers

4136 E. PACIFIC WAY

LOS ANGELES 23, CAL.

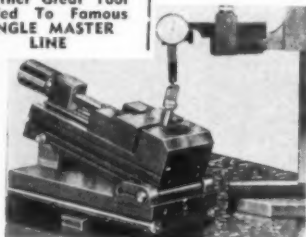
#### A QUALITY HAMMER

Recommended by thousands of  
Machinists . . . Metal Workers . . .  
Mechanics . . . and Tinsmiths

(Ask your tool jobber or write)

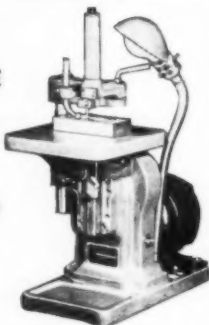
## **Now COMPOUND TILTING ANGLEMASTER SINE VISES**

Another Great Tool  
Added To Famous  
ANGLE MASTER  
LINE



### **RETRACTABLE No. 9-A DIE MAKING MACHINE for \$148.00**

*The most  
complete  
machine of  
its kind.*

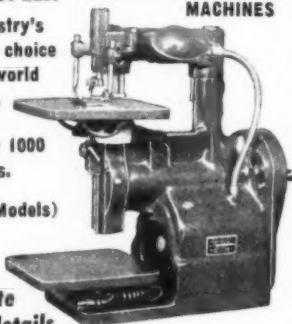


### **DUPLEX PUNCH & DIE MAKING MACHINES**

**Industry's  
first choice  
the world  
over.**

**Over 1000  
Users.**

**(3 Models)**



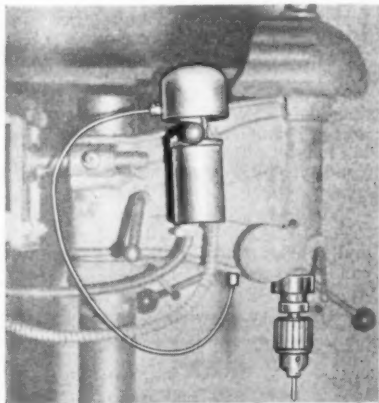
**Write  
for details**

**IDEAL TOOL AND DIE CO., INC.  
733-35 Congress St., Schenectady 3, N.Y.**

## **SWITCH-O-MATIC REVERSING CONTROL**

A new mechanical control device produced by the Switch-O-Matic Co. can be used on drill presses, engine and turret lathes, with motors of 220, 440, and 550 volts, whenever accurate automatic spindle-reversing operations are required. This unit, known as the Switch-O-Matic Reversing Control, is said to increase machine production by permitting the threading of non-ferrous materials at higher speeds.

Tap sizes are limited only to the chucking capacity of the machine, thereby eliminating the many sizes of tapping heads for a full range of tapping operations. The control can be used in conjunction with a multiple drill head, thus transforming a drill press into a semi-automatic multiple tapping machine. It can be operated either automatically or manually on intermittent operations without changing the machine set-up.



The picture shows the Switch-O-Matic Reversing Control as used when attached to a drill press. For further details, write:

**Switch-O-Matic Co., Dept. BB  
124 W. Hadley St.  
Whittier, Calif.**

**SAWING**  
**FILEING**



**GROB**  
**BROTHERS**

GRAFTON WISCONSIN

**QUICK SHIPMENT!**  
ON  
**TAPER ATTACHMENTS**



FOR ALL LATHES OLD OR  
NEW — 9" to 24" swing  
\$49.50 to 125.00

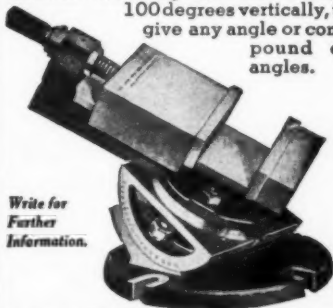
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**MASTER TAPER COMPANY**  
126 N. Clinton St. Chicago 6, Ill.  
Exclusive Mfrs. of Taper Attachments

**New Britain**  
**UNIVERSAL VISE**

**THE ORIGINAL**

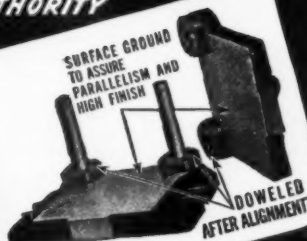
Swivels 360 degrees horizontally,  
100 degrees vertically, to  
give any angle or com-  
pound of  
angles.



Write for  
Further  
Information.

**NEW BRITAIN TOOL & MFG. CO.**  
NEW BRITAIN, CONN., U. S. A.

**BAUMBACH**  
**THE DIE SET**  
**AUTHORITY**



All Baumbach  
Die-Sets have demount-  
able Leader Pins and  
Bushings. This exclusive feature permits re-  
moving Leader pins for machine work on the  
die shoe and assures reassembly without loss  
of alignment. A big time and trouble saver.  
Write for Catalog.

**E. A. BAUMBACH MFG. CO.**  
1810 S. KILBOURN AVE. CHICAGO 23, ILL.

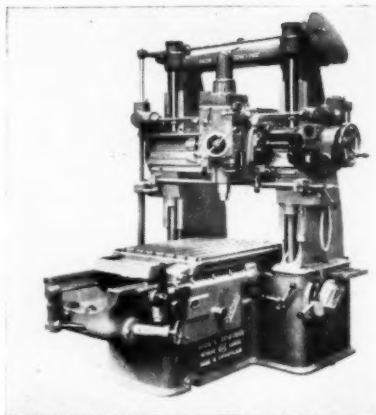


### S. I. P. HYDROPTIC-B JIG BORER AND MILLER

The S. I. P. Hydroptic B, a recent development of the Swiss firm, Société Genevois d' Instruments de Physique, was designed as a combination drilling, boring, and milling machine. Heretofore, it was found necessary to remove the workpiece from the conventional jig-borer to a milling machine when such an operation was required, making it difficult to insure uniform accuracy. By incorporating these features into one unit, it is possible to guarantee an equal degree of precision, to .0002".

The Hydroptic B is equipped with a built-in optical measuring system, consisting of scales which are read by means of micrometer microscopes.

The table working surface of this saddle machine measures 39½" x 32". Longitudinal travel of the work table is 37½"; the spindle saddle has a transverse travel of 28". The free space between the uprights is 39-3/4"; the maximum distance from the table top to the spindle nose is 28-3/4".



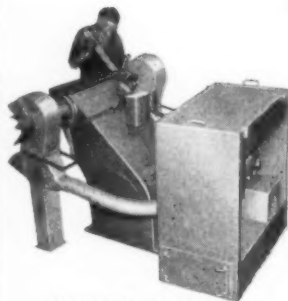
The spindle is equipped with a No. 4 Morse taper. Eighteen spindle speeds are provided, from 40 to 1250 r. p. m.

\* DUCTLESS DUSTKOPS can usually be installed in twenty minutes.

## STOP DUSTS

HOW? ... with **DUSTKOP**

WHEN? ... within 20 minutes\*



Model 1150 illustrated

Send Us the Details of Your  
Dust Problem \_\_\_\_\_

■ DUSTKOP stops abrasive and fire-hazardous wood, rubber and similar combustible dusts. DUSTKOPS are firesafe. (Built of steel and non-inflammable spun glass). DUSTKOPS have high suction, big dust storage capacity, with space-saving compactness plus high efficiency dust separation. Unit-type DUSTKOPS save power: operate only when needed. Complete line of DUSTKOPS for all dusts.

**AGET-DETROIT CO.**

205 Main at Washington  
Ann Arbor, Michigan



The machine allows six power feeds, of from 0.0015" to 0.01". The drilling capacity in cast iron is 2"; in soft steel 1½".

Cosa Corp., Dept. BB  
405 Lexington Ave.  
New York 17, N. Y.

#### ARC WELDERS STRESS REMOTE CONTROL OF HIGH FREQUENCY CIRCUIT

Two new high-cycle a. c. arc welders for heavy duty industrial use are announced. The new models, with 200 and 300 ampere output, respectively, feature a precision electrical circuit which holds the welding arc constant with selective heat settings in one ampere steps, through an air-cooled induction type transformer.

The high frequency circuit with remote feather touch control at the electrode holder, is useful for electronic fluxing and oxide dispersal requirements of such new arc processes as inert gas shielded arc welding and the Linde "Heliarc" process. This remote



control of the high frequency circuit virtually eliminates all radio interference.

Mid-States Equipment Corp., Dept. BB  
2429 S. Michigan Ave.  
Chicago 16, Ill.

**Now—  
YOU CAN DO  
HIGH SPEED TAPPING  
WITH LARGE TAPS!**



**THE NEW ETTCO #5  
TAPPING ATTACHMENT**

This newly developed tapping attachment handles taps up to 1" on any heavy duty drill press with the high speeds, sensitivity and accuracy of smaller attachments. An efficient air cooling system insures longer continuous operation without overheating. Its improved clutch insures good clean threads and provides protection against broken taps.

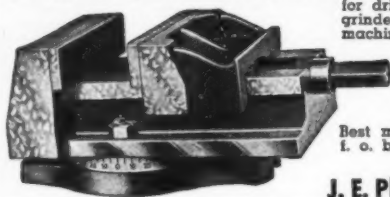
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**ETTCO TOOL CO.**

596 Johnson Ave., Brooklyn 6, N. Y.

Boston, Massachusetts • Portland, Connecticut  
Detroit, Michigan • Chicago, Illinois

## PLUNKET IMPROVED VISES



We make a complete line of modern vises for drill presses, shapers, milling machines and grinders. Illustration shows our standard milling machine vise as regularly furnished and stocked.

In ordering this vise give size of slot in table:

No. 10—6" jaws, 1½" deep, opens 5", \$55.00

wt. 45 lbs. ....

No. 20—10" jaws, 2¼" deep, opens 8½", \$75.00

wt. 120 lbs. ....

Best material and workmanship. Prices are net f. o. b. Chicago. Dealers' inquiries are solicited.

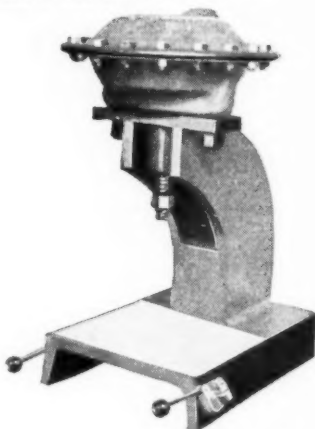
Write for folder TODAY.

**J. E. Plunket Machine Co.,** 1823 W. LAKE ST.  
CHICAGO 12, ILL.

## SANDOW AIR PRESS DELIVERS 2 TON STROKE

A new air arbor press is introduced by Sandersen Sales Service, under the trade name of "Sandow". It is designed to deliver what is called a "squeeze stroke", and may be operated by standard foot or hand valves. Three large models deliver 24, 30, or 36 times line pressure, or (at 120 lbs. pressure) a maximum of 1, 1½, and 2 tons, respectively. One model of a smaller press (9 times line pressure, or ½ ton) may be bench mounted, either vertically or horizontally, facilitating certain broaching and assembly jobs.

The stand is made entirely from hot rolled and welded steel. Power is supplied by a diaphragm type air cylinder, manufactured by Bendix Westinghouse Air Brake Co. A minimum of air is required to operate the press, so that several units can be operated off the same air line without a noticeable drop in the air supply. The non-rotating ram assures accurate registering of the die and punch.



The manufacturers claim that Sandow presses result in increased production, due to the elimination of operator fa-

## Producers of Screw Machine Products to Specifications

ONE, FOUR and SIX spindle automatics maximum capacity 2½" round. Hand Screw Machines and Universal Turret Lathes maximum capacity 3" round. Castings and Forgings machined maximum 10" diameter, 8" length, 15 pound weight. Secondary operation equipment for milling, drilling, tapping and assembling. Fabricators of aluminum, brass, steel and their alloys.

## SCREW MACHINE SPECIALTY CO.

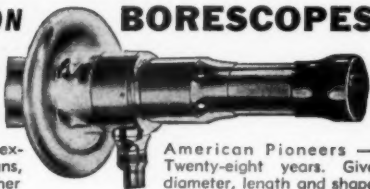
5600 Butler St., Pittsburgh 1, Pa.

## ILLUMINATED INSPECTION



"Lenox Detects Hidden Defects" while exploring the dark holes of industry — guns, hollow shafts — Refinery, well drill and other tubing, irregular dark spaces.

## BORESCOPIES



American Pioneers — Twenty-eight years. Give diameter, length and shape of cavity.

**LENOX INSTRUMENT COMPANY**

2008 CHANCELLOR ST.  
PHILADELPHIA 3, PA.

tigue, as well as uniform pressure independent of muscle power.

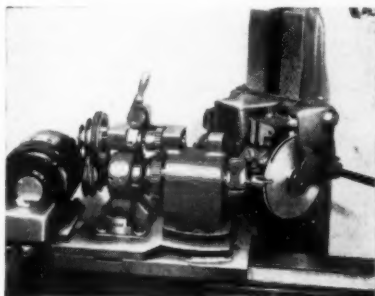
**Sandersen Sales Service, Dept. BB**  
P.O. Box 1198  
New Haven 5, Conn.

### ATTACHMENT PROVIDES IDENTICAL REPETITION IN GRINDING RELIEF

The Circularity Grinding Attachment for grinding form relief, radial relief, or both at once, has recently been announced. This device is made to fit on any conventional cylindrical or cutter grinder, and when not being used for grinding cutting tool relief, it serves as a conventional motor-driven head-stock. As the spindle of the attachment revolves, a cam generates the relief in the tool. The amount of relief may be altered by scale adjustment.

The work may be held in a collet chuck with capacity from 0" to 1 1/4", or between centers. An attachment is provided to hold the work between centers. Regardless of how much or what type of relief is required, the tool always revolves on its own axial center.

Once the set-up is made for grinding relief on a tool, hundreds may be ground with identical relief. If a set-up is recorded from the scales on the at-



tachment, that set-up may be repeated with the same relief.

**Detroit Reamer & Tool Co., Dept. BB**  
2830 E. Seven Mile Road  
Detroit 12, Mich.

## MUMMERT-DIXON SWING FRAME GRINDERS



- Standard sizes for 24", 20", 16", 14" and 12" wheels.
- For high speed wheels at 9,000 to 10,000 sfpm, or vitrified wheels at 5600 to 6000 sfpm.
- V-Belt Driven — Two speeds.
- Convenient speed change.
- No balancing weights required.

Write for Bulletin No. 3

**MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.**

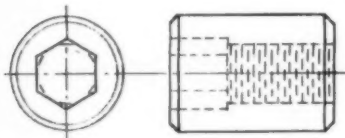
# Shop Hints

## CYLINDRICAL NUTS

By H. F. Williams

Nuts must be often assembled in places inaccessible to open end, box and socket wrenches. Such locations as narrow flanges with comparatively high walls, deep pockets and recesses and also counterbored holes sometimes require the placement of nuts. Hexagonal and square nuts are sometimes impossible to assemble and turn on the screw in such places.

A cylindrical nut as is shown in the accompanying sketch is many times the answer to such a problem. They make use of the various sizes of hex wrenches that come with hollow or socket head fillister cap and headless set screws. These wrenches are available in sizes of  $3/32"$  to  $1/4"$  across flats advancing by  $1/32"$  and from  $5/16"$  to  $5/8"$  in increments of  $1/16"$ . The nuts are made



of screw stock or better material as required and case hardened or otherwise heat treated. They are chamfered at either end or the lower end can be made like a dog pointed screw if desired. Lengths can be made to suit but the length of thread should be at least equal to the diameter of the screw thread. Depth of thread can be from 75 to 100 percent, depending on the nature of the work. The depth of the broached

hexagonal hole for the wrench should be at least 75 percent of the distance across flats but 100 percent is better. The size of hex should be at least as great as the diameter of the screw thread but may be larger if necessary.

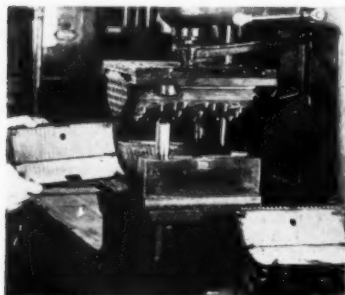
These nuts can be nested into counter-bored holes where they present a flush appearance or they may be screwed up against the surface of a flange and remain in the open. If the wrenches as mentioned above are not long enough, a short piece cut from the wrench can be welded to any length of round cold drawn steel of approximately the same size. A cross bar at the end of the rod fastened by welding will act as the turning lever or tee-handle.

## STANDARD HYDRAULIC PRESS SPEEDS ASSEMBLY OF PLASTIC RADIO GRILLES

A standard hydraulic bench type press as produced by Colonial Broach Company, Detroit, has provided a simple answer to obtaining high output rates with accurate control and ease of operation at the plastics plant of the Ford Motor Company in the assembling of metal screens to plastic radio grilles.

Ford is currently producing some 300 grille assemblies per hour on three of these 'Junior' presses, equipped by Ford with a special upper and lower die. The upper die, of cast iron with some 24 projecting 'fingers' (see photo), is electrically heated with a thermostatically controlled resistance coil.

The metal screen is merely laid over the plastic grille which is laid in the lower d.e. The control lever is then thrown on the machine, causing the upper die to move down until the heated fingers have pressed the screen into the plastic to a depth of 1/16th inch. The heated fingers of course plasticize the grille at these points, so that the screen is well embedded.



**Assembling radio grilles at Ford Motor Company.**

The head is then retracted and the completed assembly removed, the plastic solidifies to securely hold the screen at the 24 points of attachment.

Important advantage of using hydraulic press is that the pressure is 'cushioned', protecting the plastic against shock. Nevertheless the stroke of the machine is accurately controllable, by means of the standard adjustable stop on the press.

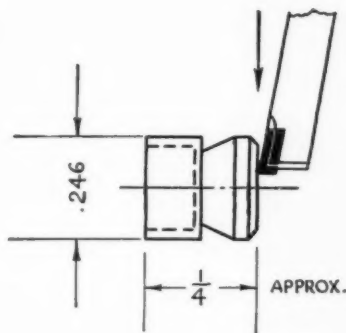
**CARBIDES ELIMINATE FINAL GRIND;  
INCREASE LIFE BETWEEN GRINDS  
TEN-FOLD ON FACING OPERATION**

Elimination of need for a final grinding operation together with increased production speed and a ten-fold increase in life between grinds of tools, has been achieved through the use of standard Carboloy (Detroit, Mich.) turning tools in place of high speed steel tools on a facing operation in a large manufacturing plant.

The operation consisted of facing plunger pins of S. A. E. 1035 bar stock as shown in the accompanying sketch. The manufacturer reports that with high speed steel tools, some 1,000 pieces were faced between grinds. Moreover, the end of each plunger pin had to be ground in order to obtain a satisfactory finish.

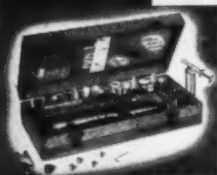
When standard Carboloy T-41 tools were installed in an effort to speed up production, the tool life between re-sharpenings jumped to 10,000 pieces, the manufacturer reports. Furthermore the Carboloy tools produced a degree of finish on the pins which made the final grinding operation unnecessary.

**PLUNGER PIN**



The tools were tipped with Carboloy Grade 78, a type of carbide possessing high wear resistance. The only special tool grinding required to fit the standard tools to this job was to increase the front relief angle from 7° to between 25° and 30° in order to clear the work.

Facing was performed on a Brown and Sharpe Automatic No. 00. Feed was .0018". Depth of cut varied from .002" to .005". The machine speed was raised to 3,300 RPM - which was maximum for the machine - giving a cutting speed of approximately 200 SFPM.



**40,000  
R. P. M.  
AND  
1/5 H. P.**



## IDEAL FOR CARBIDE CUTTERS

Speed with power with precision. PRECISE 40, the fastest, most powerful electric handtool made, weighs only 40 oz. Built for production. Mills, grinds, polishes, deburrs any material from file-hard steel to bronze, plastics, wood or rubber. Imagine, with tungsten carbide cutters PRECISE 40 mills the hardest steel!

PRECISE 40 in cool, shockproof, plastic case operates on AC-DC. Use it as a handtool or as a motorized drill in vise, lathe, mill or on your production set-up. Many accessories and rotary tools available. Also COOLFLEX Flexible Shaft attachment with 9-oz. air-cooled handpiece.

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FOR CIRCULAR

PRECISE PRODUCTS CO., 1331 CLARK ST., RACINE, WIS. U.S.A.

GRINDS  
MILLS  
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DRILLS  
FINISHES  
SHARPENS  
POLISHES

## THE NEW PRECISE 40

### 1948 A. E. S. CONVENTION FEATURES ELECTROPLATING INDUSTRY

Expected to attract thousands of individuals engaged in the metal finishing and allied industries, the Annual Convention and Industrial Finishing Exposition of the American Electroplaters' Society will be held concurrently in Atlantic City June 28 to July 1, 1948.

Technical sessions of the Convention, regarded by all metal-working industries as a valuable source of metal finishing information, will highlight recent advances of electroplating in this country.

Authorities in their respective fields will present a series of technical papers on many aspects of metal surface treatment.

The Industrial Finishing Exposition will include displays of equipment and supplies for electroplating, polishing and buffing, cleaning and degreasing, washing and rinsing, lacquering and enameling. Many pieces of electroplating and other types of equipment will be in actual operation.

Technical and business sessions of the Society and the Industrial Finishing will take place in the Atlantic City Convention Hall. The Ambassador Hotel has been appointed headquarters for the Convention.

The Society, through its Research Committee, is engaged in an extensive program of research on the quality of electroplated coating. This research work was started to help industry increase the output from

existing equipment, reduce the percentage of rejects, and raise the quality of the goods. This program which includes eight other related projects, is supported by over 200 industrial concerns, large and small, who look to the American Electroplaters' Society for cooperation and assistance.

Preliminary results have indicated that the quality of plated products can be greatly improved by good control in the plating plant, and that the ultimate consumer, for example a buyer of an automobile, will benefit in longer life of the plated parts.

## DIE SHEARING PRESS

- for Cold Heading Shops, Jewelry—  
a must for every tool and die shop



Simplifies making male or female dies — in one fourth the time required by usual methods. Used for die tryout, blanking, forming, embossing, and hobbing. Write for descriptive folder. Capacities to 1,000 tons.

**M & N Machine Tool Works, Inc.**  
156 Orono St. Clifton, N. J.

## For Better Metal Marking Use RAM'S HEAD Stamps



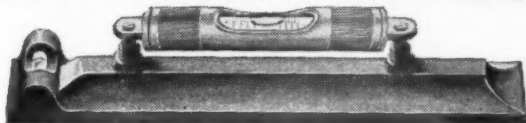
RAM'S HEAD Steel Stamps are scientifically designed to give you clear, sharp marking impressions, and to withstand hard usage. They are made of the finest tool steel, especially heat treated for long life. Striking heads are tempered by an exclusive process that prevents chipping and mushrooming. Available in individual stamps or in conveniently boxed sets.

**ACME MARKING EQUIPMENT COMPANY**  
8036 LYNDON AVE., DETROIT 21, MICH.

**SPECIFY**

*Hall...*

**PRECISION LEVELS**



**FIG. NO. 5** Adjustable type Machinists' Levels with ground and graduated vial. Grooved for use on shafting. Sizes 4", 6", 8", 12", 18".

"MANUFACTURERS OF  
SPECIAL LEVELS  
FOR ANY USE."

**FIG. NO. 50**—For setup and maintenance is accurate to 10 seconds. Graduations are in .0005" per foot. Packed in Instrument Case.

Address Orders or Inquiries to

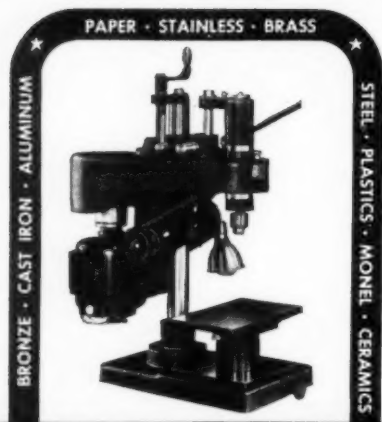
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If your job is to drill small, precision holes in hostile material try the Hamilton Varimatic Drill. It's super-sensitive; and the speed is infinitely variable between 840 and 9300 R.P.M. Clearances and travel are ample for all work of medium size. 80% of present installations are repeat orders. The reason for this popularity is built into the machine. Our Bulletin V-47 "tells all". Write for it!



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**TOOL COMPANY**

SUPER SENSITIVE DRILLING MACHINES  
TAPPING MACHINES • PORTABLES

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### CASUALTY INSURANCE ACTS AS PREVENTION AND INDEMNIFICATION

The name of the National Conservation Bureau (60 John St., N. Y. 7), nationally known safety organization, will be known in the future as the Accident Prevention Department of the Association of Casualty and Surety Companies. The change in name, authorized in a meeting of the Executive Committee, was made to clear up misunderstandings as to the purposes of the department. The former name gave no clue to the purpose of the department, and many people

had even interpreted the National Conservation Bureau as being a governmental agency.

J. Dewey Dorsett, general manager, pointed out the function and obligations of casualty insurance. It is not confined to indemnification upon an accident or catastrophe. It is a service to the public in preventing such claims from arising. Hence, the work of the National Conservation Bureau was superimposed on the program of public service in accident prevention.

Mr. Dorsett also pointed out that this cooperative work through the Association is only one phase of their contribution to safety. Association member companies, through their individual engineering departments, are now spending more than thirteen millions of dollars annually in their engineering and accident prevention work as a direct service to

their assureds and the public, particularly in the field of compensation and vehicle fleet coverage. This activity has been traditional with these companies since the early days of the casualty insurance industry.

Julien H. Harvey, manager of the Accident Prevention Department, pointed out that as early as 1910, it was recognized that an important part of this public service could be more effectively administered if the companies were to associate themselves with each other for that purpose.

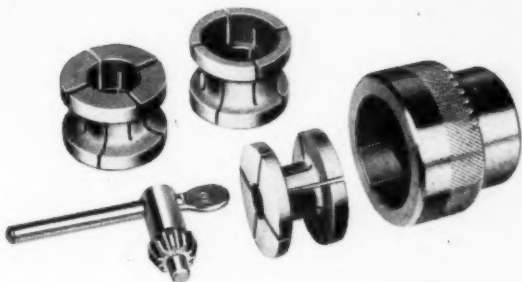


# NEW! COLLET CHUCK

A safe and accurate precision collet chuck, ideal for machine shops, schools, pattern and all shops where round stock must be chucked. The design of the chuck and collets insures a vise-like even grip that will not mar work.

There are no projecting jaws, no longitudinal play, and small overhang, insures smooth even operation.

Chuck and three double-end collets are steel — capacity ranges from 1/2" to 2".



With special adapters — the Martin Collet Chuck can be used on milling machines, drill presses, surface grinders, etc.

Sells — complete with Jacobs adjustment key — for \$18.95.

Lower priced model for home work shop use, is available at \$11.95.

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**CHUCK**

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## DI-LIFT TABLE "A"

**USES:** The MONTGOMERY DI-LIFT TABLE'S all-steel construction enables it to move, lift and lower dies easily; support overhanging work or serve as a portable work bench. The illustrated table can also be furnished with an adjustable angle top.

**SPECIFICATIONS:** All steel—Height, Min. 26", Max. 43"—Capacity, 2000 lbs.—Table top, 20" x 32"—Raise per revolution of hand wheel, 3/8"—Casters, 4" diameter (2 ball bearing swivel, 2 stationary)—Over-all width, 26"—Weight, 290 lbs.

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ELECTRIC TOOL will

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- Drive Screws up to 1/2" dia.
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- Bore Wood up to 1 1/2" dia.
- Drive Studs up to 1/2" dia.
- Drill Masonry up to 1/2" dia.
- Extract Broken Studs up to 1/2" dia.
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at Technology Center and are now in use. These are a Metals Research building erected in 1943; a wing of the Engineering Research building, 1945; and Alumni Memorial Hall, 1946.

Being completed now is a new Chemistry building and a Metallurgical and Chemical Engineering building. Under construction also are two four-story student dormitories, as part of the Institute's plan to house 2,000 students, staff, and families in permanent apartment, residence, and dormitory dwellings adjacent to the campus.

Besides these buildings, 59 additional academic, laboratory, campus, and housing structures will be erected over a five-year period according to Henry T. Heald, Illinois Tech president.

Since 1940, the Institute has grown phenomenally and outstripped its physical facilities. Its volume of research

has increased 12 times. Enrollment is up 63%. Assets have increased 120%. Faculty members have increased from 360 to 1300 persons. Annual income has increased 292%. Today the college owns 9 times its 1940 acreage.

"When Technology Center of Tomorrow is completed, it will most certainly be one of the nation's most modern centers of technological education and research," James D. Cunningham, chairman of the Board of Trustees, asserted.

Illinois Tech. is a result of the merger of Armour Inst. and Lewis Inst.

**ILL. INST. OF TECHNOLOGY PLANS  
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The world's most modern college campus is growing out of one of the nation's worst blighted areas under the impetus of a \$15,000,000 development and expansion program. Illinois Institute of Technology, 3300 S. Federal St., Chicago 16, Ill., is transforming its Technology Center campus into a functionally planned study and residential area for 10,000 persons.

With the program already underway, three new buildings have been erected

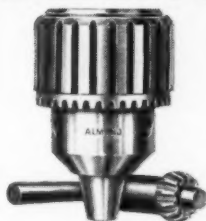


For precision punching of shim stock up to .025, also rubber, fibre, paper and plastic, the new **TRANSPARENT Shim Stock Punch** provides an easy and economical answer.

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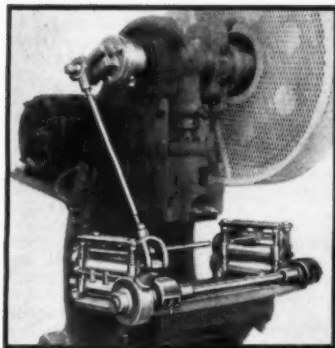


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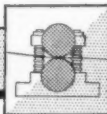
Standard models from 3" to 12" wide with up to 18" advance in both single and double feed models. Larger feeds and longer advances can be made to your specifications.

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## WIDER USE OF OPTICS IN INSPECTION FORECAST FOR INDUSTRY

The Eastman Kodak Co., Rochester 4, N. Y. forecasted wider use of optical devices to solve industrial inspection problems when they demonstrated a new contour projector at the Annual Exposition of the American Society of Tool Engineers in Cleveland.

According to a Kodak spokesman, the company has long felt that optical projection—in which the magnified image of a part is compared with a master tolerance chart or drawing — can offer an

ideal method of rapid, economical quality control of precision parts. As a result, Kodak's optics division set out to design a new contour projector particularly suited for mass inspection techniques.

Four primary objectives were set up:

1-To provide adequate staging space between the part and the first lens, even at the highest magnifications.

2-To provide freedom from distortion, at all points on the viewing screen.

3-To provide uniform, brilliant illumination, permitting the use of the instrument in fully lighted rooms without hoods or curtains.

4-To provide ease of operation by eliminating the need to refocus or make other adjustments when magnification is changed.

These objectives have been embodied in the machines exhibited and the designers' success in attain-

ing them is attested by a number of similar models already in actual use in Kodak's tool rooms, production lines, and inspection departments. These models further attest the efficient, functional arrangement of mechanical parts.

An optical system unique to contour projectors provides a constant working distance of eight inches between the part and the first lens of the projection system. This distance is maintained at all magnifications and affords ample space in which to mount efficient staging fixtures.

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A NEW METHOD OF REMOVING  
CHIPS FROM BLIND DRILLED AND  
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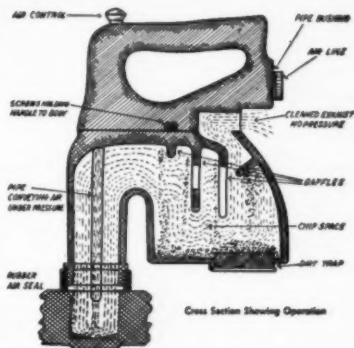
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Eliminate the danger to your workmen from flying chips by removing your cuttings with the BUFFALO PNEUMATIC CHIP GUN. Simply place the nozzle over the hole, release the air by thumb pressure and the cuttings are deposited in the body of the gun.

Available in two sizes:

Model A—For  $\frac{1}{4}$ " to  $\frac{5}{8}$ " dia. holes

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Kempsmith Plain Index Centers for production and general indexing . . . simplify job set-ups . . . relieve the operator of the necessity of counting or making any calculations. Indispensable in milling taps, reamers, small gears, sprocket wheels, special grooving, etc. Described in Bulletin No. 124.

Kempsmith Standard Attachments broaden the scope of your milling machine . . . lower capital investment . . . save in set-up time.

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Precision Built Milling Machines Since 1888

### PROPER GRINDING WHEEL STORAGE

Grinding wheels should be stacked or stored properly in order to use available storage space to the most advantage and to protect the wheels from chipping and breakage.

Wheel racks may be constructed by spacing shelves of parallel wooden rails according to the sizes of wheels to be stored on the shelves. This will eliminate the wheels' rolling off, after they are once on the shelf.

Larger and heavier wheels should be



### KEMPSMITH ARBORS

in all popular sizes or types. Adaptable to ANY make of milling machine with standardized spindle.

placed toward the bottom of the rack, and every wheel should be visible from the front of the rack and the wheels so grouped that a prompt check can be made on available wheels.

Straight wheels over 2" in diameter, except resinoid, rubber and shellac bonded 1/4" and thinner, should be stood on edge.

Dish and cup wheels, provided they are not over 6" in diameter and do not have a thin or fragile edge, may be stacked either flatwise or on edge.

Resinoid, rubber and shellac bonded wheels of the cut-off type, 1/4" and thinner, should be piled horizontally on a plane surface, which should be free from any imperfections and not likely to warp. A clean, machined steel plate, 1/4" or 5/16" thick would be suitable for this purpose.

Dish, cup, and even straight wheels, not over 6" in diameter and

made by either the vitrified or silicate process, may be stored either flatwise in stacks or on edge. If, however, there is a thin edge on the wheels, it is advisable to stack them flat, particularly softer wheels.

Wheels 2" or less in diameter are best protected by placing them in boxes or drawers with the contents plainly labeled on the outside. Mounted wheels and points should be stored in the same boxes in which they are received until needed for use.

## A NEW Swivel Conveyor HOOK

*Automatic or  
Hand Indexing  
adaptable to  
overhead chain  
and Monorail  
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**SPECIAL HOOKS  
ENGINEERED TO  
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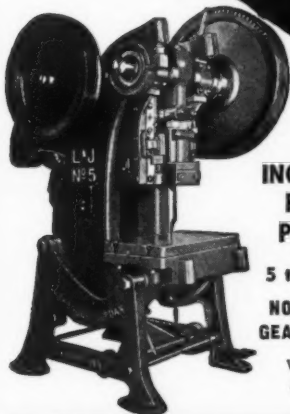


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## MARVECO LIVE CENTERS

- HIGH SPEED
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MARVECO - guaranteed to outperform and outlast any other live center. Write for free catalog. "The Marvels of Marveco."

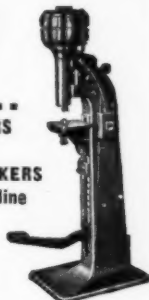
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Super is first with a complete line of standard Horizontal and Vertical Ejector Type Tools with carbide inserts in 20 types.

With Super's designs, you get greater depth of cut demonstrated in actual production—plus less down time, more grinds for your carbide dollar and greater diamond wheel economy. Super's hardened, long life holders designed to eliminate stresses and strains that cause carbide failure, can be adapted to inserts of special sizes and shapes.

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### PLAN MOBILE GAS TURBINE PLANTS AS POWER SOURCE

A long-standing need of power utilities and industry using power for a compact, easily moved, short-notice source of emergency electric current may be filled within the next few years by mobile gas turbine plants now under development by Allis-Chalmers engineers.

Studies have already been made of 3000 and 6000 kw units to be mounted on railway trucks for rapid movement over normal railway track or comparatively

oil-tank space is built into the unit to permit full load operation for at least six hours.

Units could be located on a rail siding and deliver power into a system damaged by disaster. Industrial plants needing extra power could put a mobile power plant into operation, to avoid the expense and time involved in construction of a powerhouse. It could also provide emergency service during service shut-downs or turbine failure.

irregular freight and utility yard tracks, Allis-Chalmers reports. The proposed units could operate as a sole source of power or could be synchronized with an existing power system.

Simplicity, extremely smooth operation and no requirement for water would characterize the gas turbine plants, according to Allis-Chalmers engineers. Operating on oil, the units would require only fuel line connections to tank cars or storage tanks, in addition to the electric transmission line connection.

The prime mover of the 3000 kw unit operates on the simple gas turbine cycle with regenerator. With an inlet temperature of 1300 F, the unit would have a fuel-bus efficiency of about 23 percent at full load. Mounted on eight carrying axles arranged in four standard freight car trucks, the power plant would weigh approximately 230,000 pounds. Sufficient



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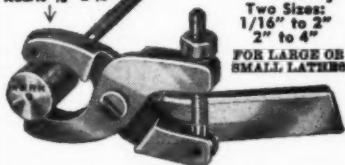
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Use any Standard  
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Two Sizes:  
1/16" to 2"  
2" to 4"

FOR LARGE OR  
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CARBIDE

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CHATTERLESS  
COUNTERSINKS

- Shear cutting action
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- Materials—up to 63-C hardness

17 stock sizes up to 2" diameter  
30° 41° 45° and 60° angles with C/L  
Shanks—plain, tang drive, tapers

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Stop losses from bent rivets, imperfect heads, loose joints, broken or marred work pieces . . . install an Airflex Pneumatic Riveter.

Rotating peen distributes 5,000 to 7,000 straight-line hammer blows per minute "around the clock." Striking first at A, then at B, etc., each impact is limited to a small cross-sectional area of rivet. No more trouble with slender, unsupported, or hollow rivets . . . no risk riveting in glass, plastics, ceramics, etc. Twelve models, bench and floor types, standard and double end. Interchangeable hammer units. Send for Bulletin 74.

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PNEUMATIC  
Tools

**LEMERT ENGINEERING CO.**  
"IN THE HOOSIER STATE SINCE 38"

1205 N. Western, Plymouth, Indiana

#### EVOLUTION OF STEELMAKING FROM CRUDE TO SCIENTIFIC METHODS

According to "Steel Facts," by the American Iron and Steel Institute, 350 Fifth Ave., N. Y. 1, the making of steel for centuries operated on a crude basis. Upon a steelmaker's personal judgement depended the quality of steel. But today, research laboratories are an important part of the steel industry and rigid specifications govern every heat.

The end of the eighteenth century saw scientists paying more attention to the properties of iron and steel. At first,

steelmakers did not recognize the importance of this work, but eventually realized the economy of having a set of standards for heats rather than use a hit or miss method. Here-tofore, they had had to allow for excess margins of safety and so the quality of the output was not always certain.

The first analytical laboratory connected with a steel plant was set up by Robert W. Hunt near the Cambria Iron Works in 1860. He was able to make immediate tests and steel production acquired scientific method and precision.

Like all pioneers, early chemists did not receive great material rewards for their work. Karl Wilhelm Scheele earned his bread as an apothecary while working on the isolation of the element manganese. P. J. Hjelm took over Scheele's work on molybdenum, because Hjelm was fortunate to have

enough money to conclude the research.

Early scientists passed along new discoveries through letters to each other and a sort of international fellowship existed among them.

Albert Sauveur is called "The Dean of American Metallurgy," and established a successful school for students interested in metallography. His fight against antagonism and jealousy was rewarded by a professorship offered by Harvard.

During the Nineties, research finally came into its own and new discoveries were being made.

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 COMBINED Boring  
 and Facing Toolhead

A Boring Head  
 That Won't Face  
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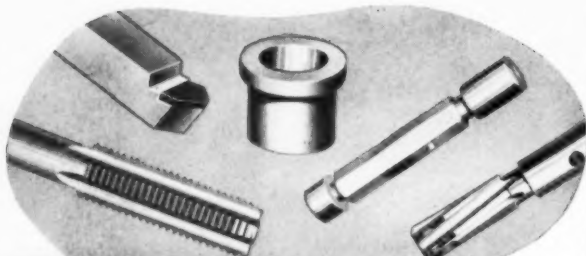


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# **HYPREZ DIAMOND COMPOUNDS**

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## **ENGIS EQUIPMENT COMPANY**

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### **COMMITTEE FOR ECON. DEVELOPMENT STRESSES PRODUCTION & COMPETITION**

Beliefs and objectives of the Committee for Economic Development, 285 Madison Ave., N. Y. 17, were recently outlined by its research director, Theodore O. Yntema. Their broad objectives are to help maintain a satisfactory high level of employment and production growth. Competition heads the list of beliefs because "it requires many independent centers of decision and innovation; it rewards efficiency and penalizes inefficiency; it keeps the doors of opportu-

ity open; it limits economic power; it moderates strife between power groups; and it obviates the necessity for direct control by the state." The government should stay out of the field of direct controls, but it does have two major responsibilities "the development of fiscal and monetary policies which will work for and not against stability; the development of a good institutional framework within which the economy can function effectively."

The major fields of study undertaken by the Research and Policy Committee were described by Mr. Yntema as: problems generated by the transition from a wartime to a peacetime economy; federal fiscal policy and structure of taxation and expenditures; monetary and credit policy; maintaining and revitalizing competition; avoiding the dissipation of prosperity in inflation; a series of special area studies dealing with policies of private business that affect economic stability; studies in areas of labor agriculture, international trade, savings and investment, and the construction industry.

The distinctive feature of CED research and policy information, as pointed out by Mr. Yntema, is "it is the only well-rounded and carefully conceived research program pointed directly at policies and actions to avoid depression and maintain the dynamic quality of the economy."

## High Speed Cutting Tools

- Special high speed circular, dovetail, flat form and special tool bits.
- Design and manufacture of small machines, jigs, gages and experimental parts.
- Regrinding and salvaging high speed flat form, special bits and small flat broaches.

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## ABRASIVE CENT-R-LAP TOOL

Saves time, eliminates diamond dressing. Cones changed in seconds. Available in 2 sizes  $\frac{3}{8}$ " and  $\frac{1}{2}$ " Cent-R-Laps and abrasive Cones.

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Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S.—Inexpensive—last for years.

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For "A" section V-belts—3.3—1 speed range—perfect belt alignment in all positions. Priced so low that no shop or machine need go without infinite speed selection. See your dealer or write (3 Types—8 sizes to choose from) **\$16.50**

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Precision Steel and Brass Collets for use in any make of lathe or other machine that they will fit.

### SPECIFICATIONS

Collet No.	Thread Dia. in.	Thread Length in.	To/In Per	Body Dia. in.	Collet Length in.	Head Dia. in.	Head Taper Deg.
3	.650	3/4	26	.6495	2-11/16	.852	12
2	.855	13/16	20	.8595	3-5/16	1.095	15
5	1.250	3/4	20	1.2495	3-9/32	1.452	10
4	.950	13/16	20	.9495	3	1.150	10

	No. 1	No. 2	No. 5	No. 4
STEEL COLLET	\$3.75	\$4.00	\$4.75	\$4.25
BRASS COLLET	2.00	2.25	2.50	2.35

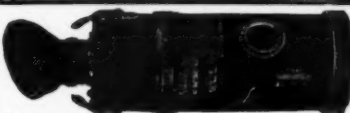
**SOUTH BEND LATHE WORKS** 4264 E. Madison St. South Bend 22, Ind.



20" Long x 12"  
Wide x  $\frac{6}{16}$ " Deep  
16 Ga., drag holes,  
handles both ends.

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Unique construction enables operators to rapidly determine temperature even on minute spots, fast moving objects or the smallest streams; no correction charts, no accessories, no upkeep.

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SERVING INDUSTRY FOR 34 YEARS

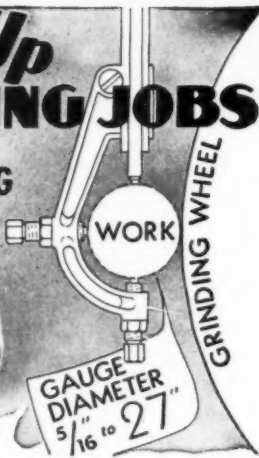
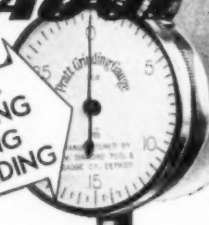
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Pratt Grinding Gauges caliper external cylindrical jobs while work is in motion or at rest. Adapted to straight or tapered work. Tolerances of .0001" plus or minus easily maintained. Visible check on out of roundness, rough grinding and chatter. Cannot grind work undersize unknowingly. Easily installed on any grinder. Pratt Grinding Gauges increase production, eliminate scrap and assure accuracy. A modern precision tool, ruggedly built.

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Send for Bulletin

## HUNTER PRESSED STEEL CONDUCTS INSPECTION COURSES

Because modern statistical methods for controlling the quality of manufactured parts (and inspecting purchased parts) hold such far-reaching benefits for component-buying industries, the Hunter Pressed Steel Co., Lansdale, Pa., have inaugurated a weekly series of free, two-day training courses for inspection personnel enrolled by their managements.

Although the course has been planned specifically for inspectors, if purchasing agents and product designers wish to take it, they are welcome. If sufficient

interest is evidenced, special sessions for purchasing agents and product designers will be arranged.

The course consists of seven lectures by top specialists in the field, one forum-type discussion, a complete plant tour, and a full afternoon of actual testing and calculating practice in using the principles learned. The course will be given in Lansdale, and the only expenses involved will be living and traveling costs.

An interesting facet of the course will be actual work with several new types of testing machines and instruments which have recently been developed for the exact measurement of important characteristics of hard-to-measure coil springs. Hunter and others expect such instruments soon to come into widespread use, and feel that understanding of their handling and importance is vital at this time.

Management men who are involved in purchasing or inspection functions are invited to correspond with Hunter regarding the particulars of the course and the possible assignment of men to take it. Ten men can be enrolled at a time, and all men from a given company are urged to come in a group. Exclusive courses will be arranged for companies of sufficient size that eight men or more are to be trained. The topic is considered of sufficient significance that the course will be continued until all qualified enrollees have been processed even if it takes five years.

## HOW TO GRIND CARBIDE CUTTING TOOL BITS ECONOMICALLY



### Here's tool grinding at its best!

Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

**LeMaire Tool & Mfg. Co.**

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*Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-it Gear Chucks.*

## SAVES TIME — MAKES MONEY MARSHALLTOWN THROATLESS SHEARS

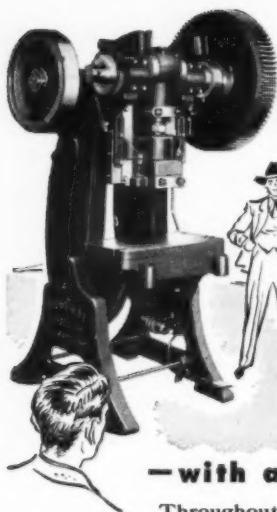
**CUTS ANY SHAPE  
CUTS ANY SIZE  
CAPACITY UP TO 1/4" STOCK**

Here's the shear that offers best performance features. Cutting speed 6' per minute. High grade tool steel cutters. Write today for details. Prompt shipment.

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Throughout the metal-working industry you'll find Federal Presses boosting production, cutting costs, eliminating accidents, performing a wide variety of jobs... and making new friends every day. Today more Federals than ever before are speeding products to hungry markets. They may help to solve your production problems. Write today for latest catalog of complete Federal line.

The Federal Press Co., 448 Div. St., Elkhart, Ind. — Tel. 2831

**FEDERAL**



**PRESSES**

## PETROLEUM REFINING FORESEES CONTINUED HIGH EMPLOYMENT AND PRODUCTION

The United States Employment Service has said a survey of condition in the petroleum refining industry indicated that employment, which reached an all-time high in 1947, will continue to increase gradually for several years.

Robert C. Goodwin, director of the United States Employment Service, Washington 25, D. C. said the study showed demands for petroleum products in 1948 will be higher than in 1947 when new all-time records in production, refining,

and sales were established.

The increase in consumer demand for petroleum products, Mr. Goodwin said, is due to conversion of furnaces from coal to oil, to the buying of more Diesels by railroads, and to greater numbers of trucks, automobiles, buses, tractors, and space heaters in use.

"Although several million dollars are being spent by the industry to expand refining facilities, shortages of steel for new refining and transportation equipment is the major hindrance retarding expansion," Mr. Goodwin said. "The result is that consumer demands are increasing more rapidly than capacity can be extended."

Total employment in the petroleum refining industry, reaching an all-time high in August 1947, dropped back slightly due to seasonal factors and has remained stable for several months. In Janu-

ary, employment in 131 establishments, representing virtually the entire industry, totaled 173,250.

According to the survey, an unusually large per cent of refining capacity was in constant use during 1947 indicating the effort made to reduce shutdowns and emergencies and to meet the 11 per cent increase over 1946 in demands for petroleum products.

"During November and December plants operated virtually at physical capacity—98 per cent," the report continued. "Nevertheless, petroleum products have been scarce."



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OF KALAMAZOO

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"400"

**HORIZONTAL  
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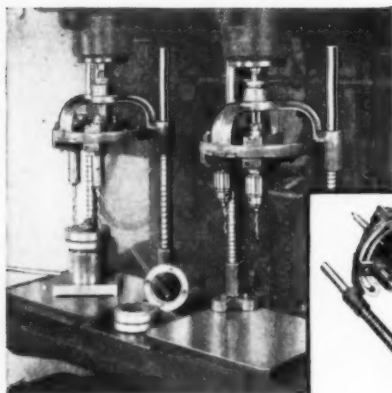


**4"  
ABRASIVE  
BELT GRINDER**

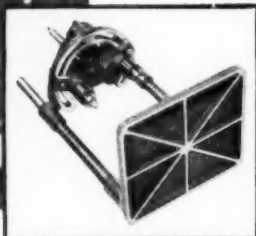
Eliminate costly hand filing, grinding, deburring and many other operations . . . There are "101" applications for the 400 in your plant. Write for bulletin.

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**Overarm Type has heavy guide pins, ground base 12 by 14 inches.**



## LINDERME 2-Spindle Head

**"increased production from 160 to 600 an hour"**

This story is typical of the many applications of Linderme 2-spindle drill heads on long and short runs. You'll like these features: drills, taps—in metal, wood, plastics; quick, accurate adjustment,  $\frac{1}{2}$ " to 6" centers; two minute set-up on most drill presses in

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**12253 COYLE AVE. • DETROIT 27, MICH.**

### ALLIS-CHALMERS DISTRIBUTES R C A VICTOR ELECTRONIC EQUIPMENT

Allis-Chalmers Mfg. Co., Milwaukee, Wis., and the RCA Victor Division of Radio Corporation of America jointly announced a new arrangement for the distribution of industrial electronic equipment portending widespread advantages to industry. Under this arrangement Allis-Chalmers will distribute RCA metal detectors in addition to its own regular line of electronic heating equipment, thus offering through its widely extended sales organization the

most complete line of this equipment available to industry. At the same time each of these companies will continue its research, engineering, manufacturing and other normal activities in the field of electronics.

The agreement brings together the broad electronic research and engineering experience of RCA and the wide industrial range and 100-year background of Allis-Chalmers to better aid industry in the selection and application of high frequency heating equipment.

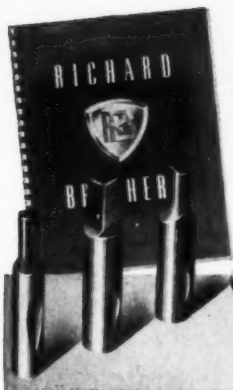
Through the work done in the RCA laboratories in Princeton, N. J. and other development sections of the company, RCA has pioneered many of the notable achievements in the field of industrial electronics.

Through its engineering and manufacturing facilities, RCA has demonstrated to

various industries the practical usefulness of gearing electronics to their needs.

The Allis-Chalmers name is well known in virtually every U. S. industry. It builds the world's widest range of power, electrical, mechanical and processing equipment. A-C too has had wide experience in electronics and brings into the arrangement its own line of high frequency heating equipment.

The wide range of electronic equipment now available includes induction heaters from 1 through 200 kw.



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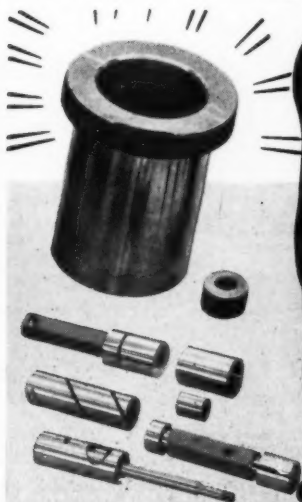
Allied's 48-page R-B catalog contains complete data and prices on R-B Interchangeable Punches and Dies — recognized and used for accurate, trouble-free punching throughout the metal-working and plastics industries. But that is only part of the R-B story. Also included in this catalog is full information on Allied's "one stop service" which includes retainers, composite die sections, rubber strippers, guide pins and bushings, and miscellaneous die makers' supplies. A copy is available to you without charge or obligation. Write for it today.

composite die sections, rubber strippers, guide pins and bushings, and miscellaneous die makers' supplies. A copy is available to you without charge or obligation. Write for it today.



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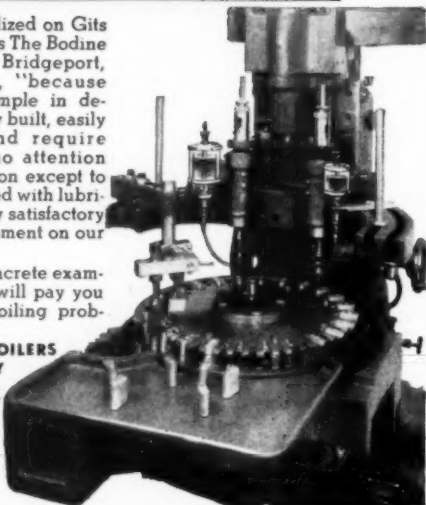
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**1947 PEAK YEAR FOR  
CENTRAL OHIO STEEL**

Net profit of Central Ohio Steel Products Company (Galion, Ohio), manufacturer of Galion Allsteel dump bodies and hydraulic hoists, rose to an all-time high of \$706,865 during the fiscal year ended November 30, 1947, according to the annual report released for publication by G. L. Stiefel, president and chairman of the board. This was equal to \$4.02 a share on 176,000 outstanding shares and compared with net profit of \$376,694, equivalent to \$2.14 per share, reported

plant rearrangement and reequipment. It is the policy of the management to have this program complete well in advance of the competitive sales condition which we feel is a corollary of a return to more normal business. We are confident in the belief that the investment in improvements during 1947 and 1948 is not only justifying itself profitwise at this time but will definitely prove itself during later periods."

Looking to the future, Mr. Stiefel said that the backlog of sales orders continues, indicating substantial business for the company for some months in the future.

for the preceding fiscal year.

Current assets on November 30, last, totaled \$2,059,726 and current liabilities \$998,161, leaving net working capital of \$1,061,565 contrasted with net working capital of \$914,250 a year earlier.

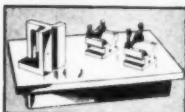
In commenting on activities of the past year Mr. Stiefel said, "The company entered the year with an unprecedented backlog of orders which was due to a demand for steel dump bodies and hoists, the shipment of which had been curtailed during the war period. By the end of the year the company was able to reduce materially the backlog of orders and found itself in a position to meet current demands more promptly.

"Although many capital improvements were accomplished during the year, there are carried over into 1948 some items of

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BEND**

**NEW SURFACE PLATE,  
V-BLOCKS, ANGLE PLATE**

**SURFACE PLATE** for checking, laying out, etc. Precision ground to .001". 12" x 17" x 3", top 3/4" thick. \$37.50



**V-BLOCKS** for holding cylindrical parts. Precision ground. 1-15/16" x 2-15/16" x 2-1/4". Cap. 1/4" to 2". Per matched pair...\$32.00

**ANGLE PLATE.** Precision ground. 3-1/4" x 3-1/4" x 4-1/4" \$20.00

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DIVIDING HEADS**

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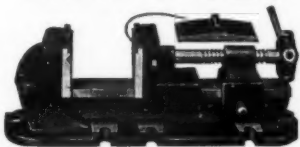
Yohe Racks take less floor space—hold more stock and require less lifting. Four arm rack, 51" high stacks, 10,000 lbs. Five arm rack 57" high holds 12,000 lbs. Flat or round stock—at safe lifting heights. Use against wall or back-to-back in center of room.

Let us send details and prices.

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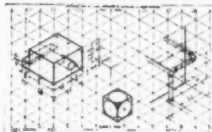
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**EASY TO MAKE  
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**New Lovejoy Dovetail Cutter**

The NEW Lovejoy Dovetail Cutter offers a faster and more economical method for forming dovetails, milling vee-slots or cutting angles. The following performance data is typical of the results which can be expected—compare it with your best!

**OPERATION:** Milling Dovetail Slots

**MATERIAL:** Cast Iron

**FEED:** 13 inches per Minute

**SPEED:** 200 R.P.M.

**DEPTH OF CUT:** 1/2 inch **TIP MATERIAL:** 883 (Tungsten Carbide)



**PERFORMANCE:** The 6" Lovejoy Dovetail Cutter has 6 blades and is run with 70 lb. Lovejoy Flywheel. The cutting action is free and even, finish very smooth. After running 1400 lineal inches to complete the job, the blades showed negligible wear.



of aluminum ingot, sheet, plates and strips, or some four times as much aluminum as the 31,160,000 pounds of ingot brought into this country.

Yet the availability of the Canadian source is of particular importance in any consideration of the military requirements of the two nations as a team.

At most U. S. locations the tremendous power requirements for smelting aluminum are in direct competition with power needs for other industrial purposes. Shipshaw power on the Saguenay River is primarily available for aluminum production.

Since the end of World War II, the Canadian aluminum production has been subjected to wide swings in demand from the U. S. market. At one period complaints were voiced that Canadian aluminum was a serious competitor of U. S.

metal, in spite of the tariff wall. Only a few months later, however, as demand for aluminum ingot rose, the swing produced a situation in which U. S. producers and fabricators were actively seeking more Canadian aluminum than was available. This situation has been intensified with the growing power shortage in the United States, and there is little indication of any easing in the demand for the light metal in the domestic market. As long as shortages continue in steel and copper, aluminum will be depended upon to fill the requirements.

## Lovejoy TOOL COMPANY INC.

Springfield, Vermont

### CANADIAN ALUMINUM FORESEEN AS INTER-AMERICAN RESOURCE

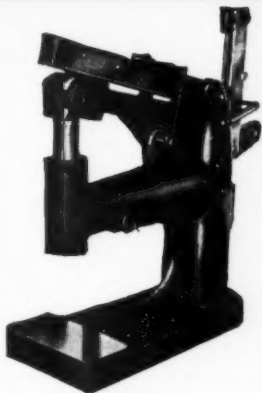
Full-capacity operation of the Canadian aluminum industry, as foreseen throughout 1948, is expected to prove a valuable inter-American resource for possible expansion of military aircraft construction as well as commercial use, a survey of the situation reveals.

In 1947 the Canadian industry produced 606,420,000 pounds of aluminum ingot, approximately 50% of the 1,142,000,000 pound U. S. output.

On a net basis, the U. S. in 1947 exported a combined total of 124,298,000 pounds

## Unskilled labor does PRECISION RIVETING

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Stroke	2"	2"	2½"
Spindle	1"	1"	1¼"
Throat Spindle	4¾"	4¾"	8¼"

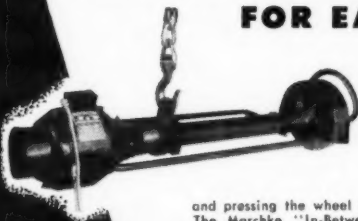
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## THE "IN-BETWEEN" FOR EASE IN HANDLING



The Marchske "In-Between" Grinder is designed to give most efficient performance with minimum effort . . . and at minimum cost.

This direct-drive swing frame grinder is easily maneuvered, permitting it to get to the work in the most efficient manner. The combination of balance and swivel suspension results in less fatigue on the part of the operator . . . his effort goes into guiding

and pressing the wheel against the surplus metal areas.

The Marchske "In-Between" Grinder is far more powerful . . . more productive . . . than portable hand tools.

Write today for further details. Other machines in the complete Marchske line include pedestal and floor stand grinders and buffers and the Heavy Duty Swing Frame grinder and Buffer.

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You, like thousands of men, can profit by this big, revised handbook—a complete tooling library in one, beautiful cloth-bound book. Order today!



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(Please Print)

#### PHENOMENAL GROWTH IN POSTWAR USE RESISTANCE WELDING

Figures on one of the most phenomenal developments in the metal working industries since the end of the war were revealed by the Resistance Welder Manufacturers' Association in Detroit. Adoption of resistance welding - including spot, seam, projection and butt welding - has grown for the fabrication of all kinds of metal products. During 1947, deliveries of resistance welding equipment to industry were over 5 times the annual shipments during the 1938-1939 pre-war period.

production, to cut cost, or to improve product quality."

"Resistance" welding is a process which fuses parts together, using localized heat and pressure. The heat to produce the weld is created by passing an electric current through the parts where the weld is to be made. The internal resistance of the metal to the flow of current heats the metal to the melting point. The time required to make such a weld is usually only a fraction of a second. It differs from other forms of welding in that no metal is added or removed.

In addition, it was pointed out by T. S. Long, president of the R. W. M. A., 1947 deliveries were almost twice that of 1942, the peak war year. In explaining this surprising development, Mr. Long said:

"World War II was to a large extent responsible for the tremendous post-war growth of resistance welding. During the war, industry was faced with the necessity of turning out vast quantities of fabricated metal assemblies of all kinds, and at unprecedented output rates.

"Resistance welding was found to be one of the major answers and this in turn served to point the way for industry toward greater utilization of resistance welding processes for peace time products. Today it is almost impossible to find an industry in which at least some manufacturers have not turned to resistance welding, either to boost



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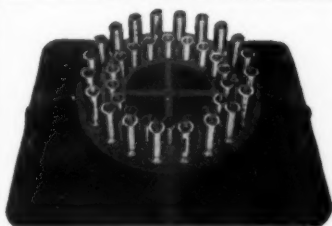
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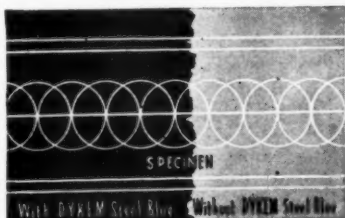
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476 or \$3.23 per share for the preceding year.

Reporting \$1,816,343 in foreign business shipped during 1947, none of it for Russia, Raterman pointed out that the rehabilitation of Europe still requires new machine tools in considerable quantity. "... Once the immediate objectives of the Marshall Plan are realized," he added, "there is reasonable expectation that it will provide some assistance in providing manufacturing facilities in the free states or Europe as a prerequisite to a revival of trade between them and the rest of the world."

Although the machine tool business has again become a highly competitive one, Raterman said that Monarch's dealers and direct sales force, enlarged and strengthened in recent months, anticipated no difficulty in finding a good market for the company's new models of

room, engine and manufacturing lathes.

"We would be short-sighted, indeed," he added, "to ignore the pent-up demand which continues to exist for the luxuries of the past which have become the necessities of the present. Nor should we forget that, by and large, there is a never-ending effort on the part of every American to make a better living for himself and his family. These things make for more business and, so long as our people retain their confidence, we can expect our business to continue to exceed by far its best prewar volume."



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Gross shipments of machine tools and accessories by Monarch Machine Tool Company (Sidney, Ohio) in 1947 ran 17 per cent ahead of the preceding year to establish a new postwar high, Jerome A. Raterman, president, said in the company's Annual Report to shareholders. Sales total was \$8,616,428 compared with \$7,368,712 in 1946.

Previously announced earnings of \$726,406 or \$3.46 per share on the 210,000 shares outstanding compared with \$678,-

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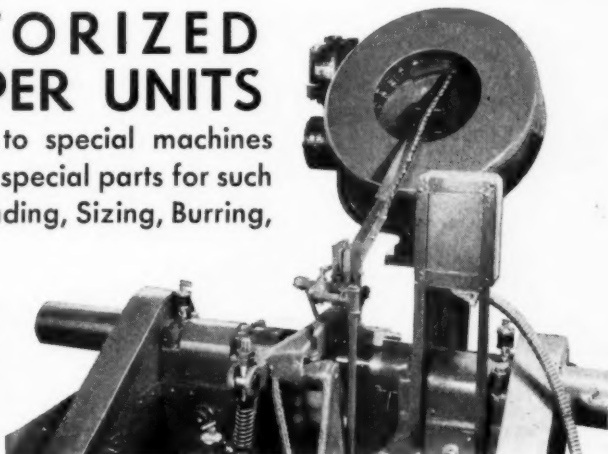
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### NMTBA SPRING MEETING FEATURES NOTED SPEAKERS

Group meetings, luncheons, dinner meetings and reports highlighted the 46th Spring Meeting program of the National Machine Tool Builders' Association at the Drake Hotel in Chicago on April 8-9, 1948.

President A. G. Bryant called the meeting to order Thursday, April 8, Louis Polk, treasurer of the Association and president of The Sheffield Corporation reported on the state of the treasury and was followed by L. D. McDonald, chair-

man, Committee on Qualifications for Association Membership and vice president of The Warner & Swasey Co., and Jerome A. Raterman, chairman, Committee on Public Relations and president of The Monarch Machine Tool Company. Mr. McDonald talked on "Qualifications for Membership" and Mr. Raterman discussed "A Public Relations Program."

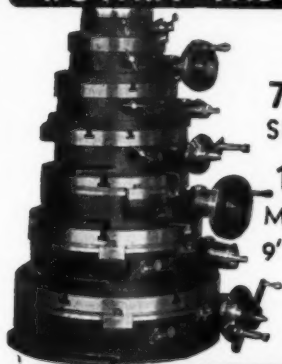
Other speakers throughout the two-day meeting and their subjects were as follows:

"Selling the World's Best Investment," by A. G. Bryant, vice president of the Cleereman Machine Tool Company; "Importance of Recognizing 1948 Costs," by Arnold K. Brown, chairman of the Committee on Fiscal Affairs and vice president of Brown & Sharpe Mfg. Co.; "Machine Tools in European Recovery," by M. A. Hollengreen, chairman of the Committee on Government

Relations and president of the Landis Tool Company; "Comments on Technological Stagnation," by William J. Kelly, president of the Machinery & Allied Products Institute.

Other topics covered were "A Critique of the American Economic System," by Paul G. Hoffman, president of Studebaker Corporation; "The Foreign Market," by Ray F. Ingram, vice president of the Landis Tool Company; and "Fundamentals of Machine Tool Selling," by J. C. Herbert, sales manager of Jones & Lamson Machine Company.

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#### ASTE PLANS FOR 1950 EXPOSITION

Plans for another giant industrial exposition to be sponsored by the American Society of Tool Engineers in March of 1950 were announced by Harry E. Conrad on the closing day of the highly successful Tool Engineers' Industrial Exposition held March 15-19 in Cleveland's Public Auditorium.

"The 1948 show broke all previous records both for attendance and general

excellence." Conrad declared. "A gate count of 63,524 revealed that the 22,427 registrants visited the exposition not once but several times during the five-day period. This year we had many more exhibitors than we did in 1946 and the total floor space sold amounted to nearly 10,000 more square feet in the recent show than in the previous one."

Latest innovations and improvements in machines, tools, processes, methods, and techniques were displayed by 336 manufacturers of industrial equipment and vendors of allied services. A total of 1,224 representatives of these exhibitors were required to man the booths.

Among the visitors were many tool engineers and other production men from all parts of Canada, where the ASTE has five chapters. A large number of foreign countries were represented, in-

cluding England, France, Sweden, Switzerland, Belgium, Denmark, India, Chile and Argentina.

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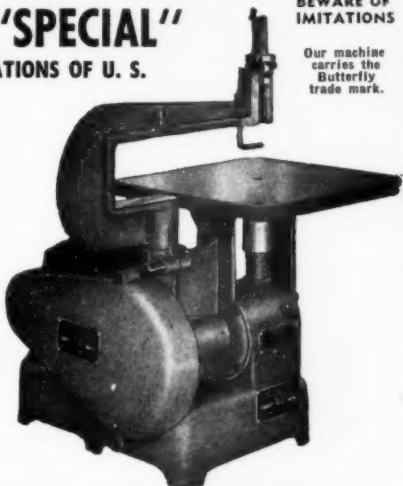
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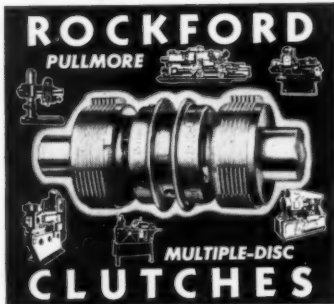
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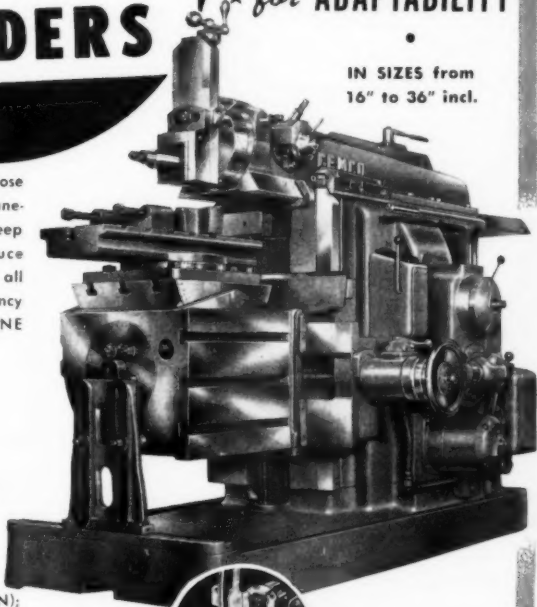
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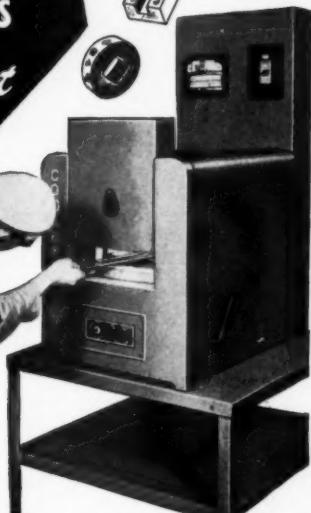
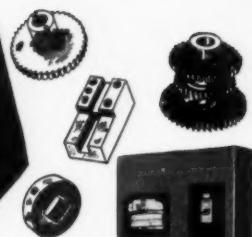
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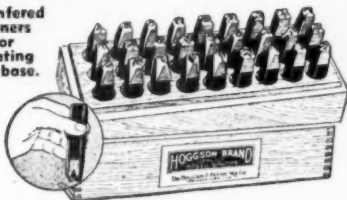


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21 in.	20 in.	800 lbs.
43 in.	29 in.	800 lbs.
43 in.	29 in.	2,000 lbs.
6 ft.	5 ft.	5,000 lbs.
8 ft.	8 ft.	10,000 lbs.
Any	Any	24,000 lbs.
43 in.	30 in.	800 lbs.



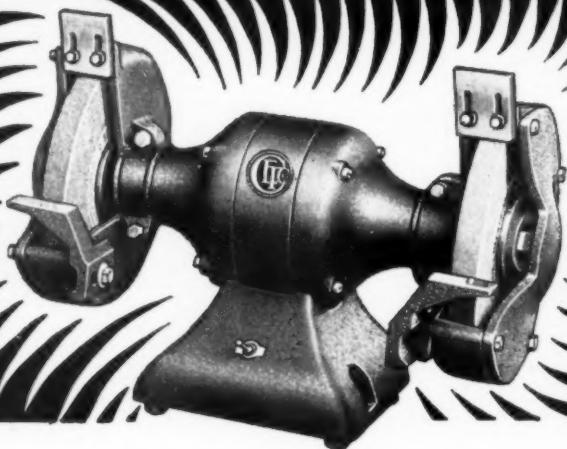
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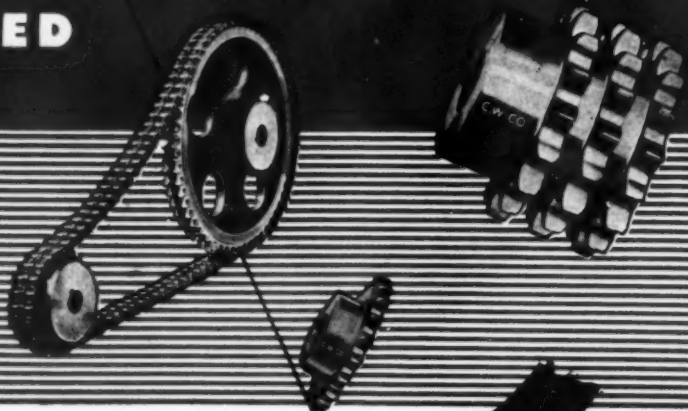
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